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WE GUARANTEE, that of this issue 9.000 copies were printed; that of these 9,000 copies, 7,461 were mailed to regular paid subscribers to the weekly edition, 250 were provided for counter and news companies' sales, 1,173 were mailed to advertisers, exchanges and correspondents, and 116 were provided for samples and office use; that the total copies printed this year to date were 261,700, an average of 9,347 copies a week.

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The Railway Age Gazette Mechanical Edition recently held a competition on draft gear, a prize of \$100 being awarded for the

The Draft Gear best article showing which type of draft gear should be used. The prize was awarded to E. W. Newell, of Pittsburgh, and Mr. Newell's article, together with two of the three other articles which were

used in the July Mechanical Edition, are reproduced elsewhere in this issue. Of the twelve papers which were recommended by the judges for publication, ten favor the friction draft gear. There can be no question as to the necessity of more care on the part of the mechanical department in providing the best type of draft gear and of seeing that it is maintained in good condition.

On the other hand, and Mr. Wells brings this out clearly and forcefully, the cars are now seriously abused in switching service and it is squarely up to the operating department officers to see that the careless and rough handling of cars at terminals is stopped. Mr. Umshler, general yardmaster of the Illinois Central at Centralia, Ill., in the first prize article on "The Operation of Large Classification Yards" in the Railway Age Gazette of July 3, directed attention to this as "one of the paramount questions of successful yard operation." The damage done to the cars by this rough handling is serious enough, but when the cost of delays to traffic, shortage of equipment, damage to freight and the effect on the organization are considered it is imperative that the roads study carefully the draft gear problem with the idea of using only the best, because that will be the cheapest in the end, and that more care be used in handling the cars by the operating department.

In the establishment of the parcel post the Government has entered into competition with the railroads and the express com-

Mail Pay Rates Still Unsettled

panies in the business of transporting merchandise-freight. Mr. Peters puts emphasis on this point in his latest appeal to Congress, which is printed in another column. It is important to remember this

when considering the prices that the postoffice department ought to pay the railroads. The original purpose or theory of the national postal service was that of disseminating information, and weight was not a chief factor. For letters weighing fractions of an ounce the payment by the Government of an arbitrary rate was not intolerable. The irrational plan of fixing the price in the halls of Congress, without consultation with the carrier, could be peacefully submitted to. But when to ounces of letters are added wagon-loads-tons-of merchandise, the unreasonableness of the arrangement becomes apparent to everybody-except to the blind statisticians of the postoffice department. Mr. Peters says that the railroads object to being paid wholly by space. The question of space versus weight, however, is not so important as that of getting some method of paying according to actual service, instead of by four-year periods on a one-month average. Spacerates might possibly be made tolerable, though inequitable, for the same reason that per diem rates for freight cars, though not always equitable, are tolerable; their simplicity and the facility with which they can be accounted for outweigh any small injustice involved. Competition, the rules for which are formulated by one only of the competitors, is hardly fair. Not the least of the problems before the Congressmen, therefore, is the preliminary problem suggested by Chairman Bourne-whether the postal laws are to be formulated by Congress or by a bureau of the executive department.

On two divisions of the St. Louis & San Francisco the wife of every employee has received a pass, good for six months,

Season Passes for the Wives of Employees over the whole division; this by way of recognizing the excellence of the division from the standpoint of "Safety-First." The arrangement is described on another page of this paper. The influence

of wives and mothers over their husbands and sons in the matter of these men's habits, as related to personal safety, has been recognized from the first, and ladies have been invited to safetyfirst meetings everywhere; but what is a picture-show lecture, even with band concerts and ice cream thrown in, compared with a piece of cardboard which can be valued in dollars, perhaps scores of dollars? For the time being the shopman's or the section master's wife is on a level with the directors' wives. Mr. Nixon has been exceedingly liberal with his passes; but, evidently, he wished to make his advertisement loud enough to be heard by all; and a little excess can do no great harm. He can hereafter vary the terms of the grant as circumstances may indicate that they ought to be varied. As we suggested in commenting on the motion pictures, variety and novelty are important elements in the safety-first movement. Making all calculations on the basis of statistics of results, which is only a crude measure of men's carefulness, the keeper of the accident records cannot expect to determine very accurately who deserves a prize; but, nevertheless, if he can arouse general interest he may do a great deal of good.

The Texas Railroad Commission is taking with very bad grace the recent decision of the Supreme Court in the Shreveport rate

A New Experience case, in which the railways were authorized to advance rates in Texas to correct a discrimination against Shreveport, La., shippers who had to pay higher interstate rates into Texas. It was perhaps not to

be expected that they should be overjoyed at the prospect of having their rates subjected to somewhat the same kind of regulation that the railways have had. The Texas commission has heretofore been inclined to consider itself as rather above the laws. Therefore, it was a new experience when the railways submitted to it a new tariff of advanced rates from Dallas and Houston to East Texas points, backed by the authority both of the interstate commission and the highest court of the law, with a request that the Texas commission approve it, as a matter of form and in the interest of harmony. This the commissioners declined to do at the hearing and at present writing they have not yet signified any intention of graceful acquiescence, although the tariffs have been filed. Commissioner Williams even argued for a compromise based on a slight advance in the Texas rates and a slight reduction in the interstate rates, although the latter had been pronounced reasonable by the interstate commission. Apparently an interesting situation has been created, for if the rates from Dallas and Houston are advanced, those cities will be at a disadvantage unless the rates from other points in the state to East Texas are also advanced. Chairman Mayfield is quoted as complaining that every time the Interstate Commerce Commission touches Texas rates it is to raise them. Of course, Chairman Mayfield could not be expected to discuss the reason for this, but to many others the statement is rather significant that there has been something the matter with Texas rates. The Texas commission undoubtedly has the power to make things rather disagreeable for the railways in retaliation, but the present time affords an unusual opportunity for observation of the handwriting on the wall.

THE AUTOMATIC TRAIN STOP-I

In the report of the committee on automatic train stops, laid before the American Railway Association at its last meeting and printed in the Railway Age Gazette, May 29, page 1192, there is presented for the first time a clear cut official declaration against the use of automatic stops; and setting over against this the demand of the Interstate Commerce Commission that a safeguard of this kind shall be introduced on our principal railroads, we may say that we have a more definite issue than has existed at any time in the past; the problem is measurably simplified. It will be worth while to look for a moment at the grounds on which is based this conservative opinion of the committee. With these grounds clearly defined we can the more intelligently compare the opposing views.

The committee says that our present system of visual signals, if properly installed and maintained, is so nearly perfect that both the railroads and the public authorities should direct their efforts towards the enforcement of obedience to signals rather than the installation of additional devices. Reading a little between the lines, one concludes that the members of the committee regard the whole automatic stop proposition as so difficult and costly that it ought to be put aside as unworthy of attention. The committee wisely omits the old argument that an automatic stop impairs discipline; that, with

it the enginemen will be less vigilant. It has been demonstrated that stops stimulate vigilance rather than the opposite.

The committee must, of course, take for its main groundwork the very high percentage of safety to be found in the present records of the best roads. When a road carrying twenty million passengers yearly goes ten years without a fatal passenger train collision, that good record must be due to something more than good luck. Whatever may be said of individual disasters, the fact remains that under the best conditions, the percentage of failures is so small that we are justified in saying that those failures really are accidents, not constitutional faults of the system of operation. To produce such a very high percentage of perfect operations the system must have merit. Railroading is a dangerous business, and, in its development, innumerable risks have been met and overcome. The records for safety of train movements which are made year after year on our busiest lines, such, for example, as those between New York and Philadelphia, constitute a really great achievement. A similar history of long continued, well-directed efforts and high standards of operation is to be found on numerous suburban lines and at the great passenger terminals. These records testify to the high efficiency of American locomotive runners (it is to be borne in mind that the automatic train stop is designed to do only one thing; to provide against the failure of enginemen to see and obey signals).

The committee is justified in basing its opinion on what can be done, not under average, but under the best conditions. If each road had put forth proportionately the effort, the knowledge and the money which have made the best American safety records, the train-accident record would have been smaller than it is by a very large percentage. Moreover, by any rational theory, it is a duty to improve existing practices, methods and standards, regardless of what may be done about new safeguards. The report is inadequate at this point, for it seems to be designed simply to head off those governmental busybodies who ignorantly think that a complicated machine can accomplish impossible wonders, when logically, the committee, to carry out the spirit of its declaration, ought to sound a "clarion appeal" to the members of the association to take vigorous action to perfect their practice with the ordinary visual signals. But, whatever the shortcomings of the report, there is no gainsaying that if every railroad officer were to do his very best, and if all were guided by a strong and energetic national committee. the safety of trains could be much more securely insured than it is at present, without resorting to the automatic stop.

Secondly, the committee could point to much progress in this direction already accomplished. For a road to carry al! passengers safely for ten years may not be conclusive evidence that all its appliances and methods are the best, but the records of surprise checking, of improved attention to the bodily and mental health of enginemen, and other improvements that have been made during the past five years by numerous prominent roads, afford tangible evidence that correct practice is being constantly studied. Moreover, those who believe in improving present methods, in preference to making a change which introduces new difficulties and greatly increases cost, can point to the fact that a large proportion of the notable collisions which would have been prevented by automatic stops have been due to faults of enginemen which may be very easily cured. For example, Corning: total abstention from intoxicants. Stamford: adequate instruction of new runners. At Western Springs and North Haven the responsibility of the company was greater; but most students of the subject believe that with suitable distant signals these collisions would not have occurred; a very simple remedy compared with automatic stops. There are plenty of other examples.

But the third and strongest claim of the committee is that the difficulties connected with the use of automatic stops would be almost insuperable; not quite insuperable (though, that,

no doubt, is the view of the most pronounced conservatives), but presenting such all-pervasive and constant difficulties that the perfection so confidently promised by the theorists would never be achieved. These difficulties were the subject of an article by Mr. Rudd, signal engineer of the Pennsylvania, printed in the Railway Age Gazette, June 6, 1913, page 1211. For fast trains there must be an overlap of 4,000 ft. to give stopping space; a costly sacrifice of capacity. For slow trains this necessitates unnecessary stops, which bring in new dangers, The "stop-and-proceed" rule, in automatic territory, is troublesome enough already, and it would be made more troublesome; for if trains were kept further apart they would the With long more frequently approach occupied blocks. freights this consumes valuable time. This waste of 4,000 ft. must be borne at every crossover and every diverging track-every place where the automatic apparatus is to be used. An engineman with a light train (and often with a heavy one) having been stopped, could then proceed, increase speed and run into the train ahead. In other words, the stops cannot in practice be located close enough together to provide against all careless running. If the special apparatus gets out of order on the road, the train may have to run a hundred miles with it out of service, which introduces a difficulty in discipline. With two or more engines on a train all but the leading one must be cut out-another chance for neglect on the part of trainmen to cause trouble.

Certain desirable characteristics of a workable stop have not yet been developed to any satisfactory degree. With everything in good order, the apparatus should be selfdetecting-revealing its own failures-but to maintain this condition without causing frequent undesired stops, is a detail yet to be learned. To guard against the tricks and the laziness of the occasional engineman who lacks conscience, and against anything that will discourage instead of encourage a vigilant habit, a device to record every operation of the stopping apparatus is desirable; so much so that most inventors include this as one of the elements supporting their claim to infallibility; but such a device introduces a new train of annoyances which as yet no one has thoroughly studied. It may be said that the railroad profession ought before now to have solved some of these problems, but it cannot be said that they continue to exist because no one has tackled them. The trouble is that they are very hard to deal with. No experiments to explore the difficulties with snow and ice have yet been satisfactorily completed. None of the experimenters, so far as we know, have gone thoroughly into the question of automatic application of brakes on very long freight trains. In short, the whole problem is so complicated and makes demands in so many directions, and every solution leaves so many things unsettled, that the wisest heads are nonplussed.

It will be said that all difficulties could be solved if sufficient money were forthcoming. Accepting this dictum as correct, theoretically, there are limits to its application. The Pennsylvania might easily spend \$5,000 a mile for automatic stops; but it is a grave question whether it could rightfully use its money in that way. Everyone admits that the automatic stop is an adjunct only. The system of visual signals should be perfected in advance of the adoption of refinements. The Pennsylvania, says Mr. Rudd, needs to spend \$3,000,000 a year to improve its present signal system. To go beyond that and spend additional millions for stops would be using money which very likely would do the public more good if used in other directions-removing grade crossings, making safer cars, giving employees better training, etc. Moreover, the problem in some situations is so troublesome, as Mr. Rudd shows, that the use of stops would so reduce the capacity of the road that additional tracks would at once become necessary, and additional tracks cost many millions of dollars for very short distances.

The other side of this problem, the accomplishments and

the hopes of those who advocate stops, and the points on which they dispute the conservatives, must be left for discussion in a future issue.

AMERICAN SOCIETY FOR TESTING MATERIALS

THE meeting of the American Society for Testing Materials, which was held in Atlantic City last week, was the largest in the history of the society and held the interest of the members well sustained to the end. In commenting on the proceedings of this society at the close of the convention a year ago, attention was called to the fact that the adoption of standards to the extent that prevails did not carry the weight and respect that it ought, owing to the manner in which these specifications were voted upon. This was frankly recognized in an unofficial paper this year by the secretary, in which he called attention to the fact that many standards for specifications were adopted on a vote of less than one hundred out of a total membership of the society of more than sixteen hundred. A number of suggestions were made as to the best means of getting an intelligent vote on questions submitted, but it is acknowledged that the problem is a very difficult one. The trouble lies in the wide diversity of interests and specialities that are represented. All classes of materials come under review with the result that there are a comparatively few members that are competent to sit in judgment on the value of any one set of specifications. Evidently it has been realized that the society has been going too fast in some particulars and has jumped to the adoption of standards and specifications without due consideration, for the whole tenor of the meeting this year was to go slow, though the tendency was violated in some particulars.

The handicap of the widely diversified interests that are involved made itself apparent this year, as it has before, in the meagerness of the discussions. It is safe to say that there was not a paper or report, of the 59 presented, that received the discussion which it deserved. When discussion was progressing freely it was frequently found necessary to curtail and cut it off because of the limited time available for the work. With 64 items on the program to be presented and discussed in nine sessions, averaging about two hours and a half each, the actual time allowable for each item would not be more than about 20 minutes, and it often happened that quite as much time as that was required for the presentation alone.

While, as a whole, the society may be getting more conservative in the adoption of standards and specifications, it still shows spasmodic tendencies in the other direction. There are some of the specifications that have been referred to letter ballot at this meeting that appear to be useless. If an article is of general use and must be made for a large number of consumers by a large number of manufacturers, the specification may be necessary, but when the work is limited to a few makers or to makers who are themselves the consumers, it is difficult to see where the usefulness of the standard comes in. Take, for example, the specification for the cast iron to be used in locomotive cylinders. It is doubtful if the few large locomotive builders of the country would allow their methods of foundry practice to be modified by the specifications of the society, nor is it conceivable that any railroad making its own cylinders would consider itself bound to use these specifications for its own work simply because it has been adopted as a standard by this society. It would have seemed better, then, to have simply put this out as a committee report that makers of locomotive cylinders could use or not as suited their own ideas and foundry practices. In fact, when it comes to the last analysis, all of the work of the society resolves itself down to committee reports that the society has adopted without the majority of the members being able to judge as to whether the reports are solidly founded or not.

Of course, the society could not have obtained the prestige that it has unless its committees had been composed of men who are expert in the lines of investigation and report assigned to them. But, while there may be every confidence in the ability of these men, great care should be taken that there is no suspicion of the domination of any particular interest in their decisions. Piazza talk sometimes is a far better indication of what men are really thinking than the discussion on the floor, and at Atlantic City last week there was more than one hint thrown out that the committee reports are getting to be dominated by the manufacturing interests. This may or may not be true, and one can only be convinced one way or the other by a careful consideration of the reports in the fullest detail. But the point is that there should be no suspicion of such a thing.

Then, there is the attitude of the society towards other organizations that more truly represent the manufacturers or consumers along special lines. It should always be borne in mind that it comes as a suppliant, as it were, to the manufacturers and users, and must present its specifications with hat in hand, It cannot enforce their use, and they must appeal to these outsiders before they can be made worth the paper that they are printed upon. This was promptly recognized on two occasions during the recent meeting. When the subject of steel springs was up for consideration, the original specifications included the springs for automobiles. These were unsatisfactory to the automobile builders, and so all reference to that branch of the art was canceled from the report as it will be submitted to letter ballot, and the matter was referred back to the committee for further consideration. Again, it was stated on the floor in connection with a matter in which the Master Car Builders' Association was interested, that that association was recognized in Washington and that it would be necessary to conform strictly to its ideas of what was wanted before the specifications could be presented.

It was rather difficult to understand, then, the reversal of this attitude in the matter of heat-treated axles as applied to the motor axles of electrically driven cars. The Electric Railway Association sent a representative to the meeting to protest against the adoption of the specifications as presented for motor axles and simply asked that these axles be excepted from the specifications. The request was refused in a manner so emphatic as to be quite dumbfounding. If the Electric Railway Association is equally emphatic in its decision as to what it wants, and at the fall meeting votes to discard the specifications of the Society for Testing Materials as unsatisfactory, it will be difficult to see what may be the value of those specifications. As to which of the two associations are correct in this particular case, there is no place for discussion here. But it does seem that the promulgation of the specification as a standard had better have been delayed until an agreement with the users was reached.

But back of any differences of opinion that may exist as to the value of the specifications for use and their desirability in the abstract, there is one thing that stands out pre-eminent, and that is the great amount of work and interest that has been done and displayed by the several committees. There is hardly a report submitted that cannot be called a masterpiece. It is to be regretted, however, that there are not more papers giving the results of the personal research work of the members. Many of them are engaged in work of this character all of the time and it is regrettable that more of it does not come to the light of day at these meetings. Diversity of interest is, of course, partly responsible for this, as men do not like to present the results of work in which they are vitally interested to a meeting, in which their own presentation must be limited to a few minutes and the discussion thereon to seconds.

There will be universal disappointment at the outcome of the paint experiments on the Havre de Grace bridge of the Pennsylvania Railroad. According to the committee, no conclusions or statements can be made as to what was accomplished because of the lack of data concerning the materials used. Engineers all over the country have been waiting patiently for years to learn what might be a good practice as based on these results, and now to be told that "the king of France marched up the hill only to march down again," with nothing but his exertions to show for it, is discouraging and the action of the society in

referring the matter back to the committee with the plea that it make a final attempt to tell what it all means, if it means anything, was certainly a move that will meet with universal approval; and it is to be hoped that the manufacturers who supplied the paints will also now furnish the information needed to compile a report of value. In like manner the much-talked-of and widely-heralded Atlantic City panel tests are concluded, but here it is expected that a full report will be submitted next year and the results of these years of trial will be made public in a manner that will be of value to all who have to do with the making and using of paints.

THE DELAWARE & HUDSON

WITH the sale recently to Kuhn, Loeb & Company of \$4,-500,000 first and refunding mortgage 4 per cent. bonds the Delaware & Hudson rounded out the operations which belong to the calendar year 1913. In March of that year the New York Public Service Commission approved the issue of these bonds to be sold at 95 or better; but contrary to the expectations of both the road's management and its bankers the company was unable to dispose of them at that price during 1913. The company had begun 1913 with a floating debt of \$3,500,000, and this had been increased during the year by \$1,000,000 through expenditures for additions and betterments covered by the first and refunding mortgage and for advances to subsidiary companies for which the parent company is to be, or has been since the last of the year, reimbursed. The present sale, therefore, presumably permanently finances these expenditures that had been previously temporarily financed through loans and bills payable.

The Delaware & Hudson Company's income is principally from two sources, from the mining and sale of coal and from the operation of its railroad. In 1913 the company had larger gross income and larger net income than in 1912, both from its coal mining department and from its railroad department, and while it is true that during 1912 there was a strike in the coal fields which adversely affected both revenue from coal operations and revenue from railroad operations, 1913 was not entirely free from labor troubles. There were ten strikes in all during 1913, despite an agreement entered into the previous year by which a method of adjustment of differences without strike and without a lockout had been agreed upon by the men and by the company. In 1913 the gross revenue from the coal mining department was \$16,045,000, and net after the payment of expenses and taxes \$1,188,000. This compares with \$13,398,000 gross and \$1,024,000 net in 1912.

In the railroad department the company was able to hold down its transportation ratio to almost the same figure as in 1912, despite large increases in rates of pay due to the apparently inevitable compromise by arbitrators under which organized railroad employees get something more than they had previously been getting and something less than they had the audacity to ask for. The ratio of railroad expenses to railroad revenue was 62.97 in 1913 and 62.57 in 1912. The company was able to maintain this operating ratio, despite the wage increases, first, because of economies which would naturally result from a larger gross business; second, through an apparently actual more efficient use of the plant itself, and third, through a reduction in maintenance of way expenses which in part offset increases in maintenance of equipment expenses.

Railroad operating revenues in 1913 amounted to \$24,153,000 as against \$22,480,000 in 1912, representing the revenues received for carrying 20,470,000 tons and 9,029,000 passengers in 1913 and 19,319,000 tons and 7,950,000 passengers in 1912. The average haul per ton of freight in 1913 was 148 miles, and in 1912 was 146 miles, and the average passenger journey 17.39 miles in 1913 and 18.82 miles in 1912. The average ton-mile rate was exactly the same in the two years, namely, 6.6 mills, and the rate per passenger per mile was 2.02 cents in 1912 and 2.05 cents in 1913. It will be seen, therefore, that the percentage of increase in operating revenue just about represents the increase in the percentage of business handled, the slight difference due to the shorter average.

age passenger journey and slightly larger revenue per passenger per mile being negligible.

Transportation expenses, which include only the wages, of trainmen, station employees, etc., and the cost of fuel and other materials incident to the actual movement of traffic, amounted to \$8,585,000 in 1913, an increase of \$606,000 over 1912, which is about 7½ per cent., or almost exactly the same percentage of increase as is shown by the business handled and the revenues earned. Since the rate of wages was higher and the cost of fuel per ton also higher in 1913 than in 1912 this means a movement of traffic per man-hour and per ton of coal considerably greater in 1913 than in 1912.

The revenue train load in 1913 was 543 tons, and the total train load, including company freight, which is the better measure of operating efficiency, was 585 tons, an increase of 52 tons, or more than 9 per cent. over 1912. The average number of all cars, excluding cabooses, per train was 31 in 1913, an increase of over two cars; the average number of loaded cars per train was 20.76, an increase of 1.23. The average number of passengers per train mile was 54.88 in 1913, an increase of 2.78 over 1912.

Maintenance of way, which includes the wages and cost of material used in maintaining the railroad plant exclusive of the rolling stock, was \$1,788,000 in 1913, as against \$1,940,000 in 1912. Maintenance of way, of course, under ordinary circumstances would not increase anywhere near in proportion to an increase of 7 or 8 per cent. in traffic handled, and the actual decrease in expenditures on this account in 1913, is explained in the annual report as being due to heavy charges in 1912 on account of maintenance charges incidental to the strengthening of bridges and other additions and betterment work then under way. This addition and betterment program was carried on in 1913, as well as in 1912, and \$1,041,000 was expended on this account in 1913.

The Delaware & Hudson is a short road, 904 miles, having a heavy freight density, with coal forming a large percentage of its total tonnage. Of the total 904 miles of road, 341 have second track and about 20 third and fourth track, with a total of 634 miles of yard tracks and sidings. The freight density-ton miles per mile of road-was 3,616,000 in 1913 and the passenger mileage per mile of road, 186,000. Of the total 22,269,000 tons carried in 1913, 1,800,000 tons were company freight. Of the remainder 63.93 per cent. was products of mines, 13.97 per cent. manufactures, 7.99 per cent. miscellaneous car load freight, 5.08 per cent. products of agriculture, 4.86 per cent. lumber, 3.13 per cent. merchandise (L. C. L.) and 1.04 per cent. meats and products of animals. The tonnage of all classes of commodities, with the exception of grain, bituminous coal, lumber and bar and sheet metal, and certain other negligible exceptions, increased, the most notable increases being in coal, cement and merchandise.

The Delaware & Hudson is a rather lightly capitalized property; the total outstanding securities, including the \$4,500,000 of floating debt which has just been permanently financed, amounted at the end of 1913 to \$104,923,000. Subtracting from this the book value of unmined coal owned and advances on unmined coal and the book value of stocks and bonds, we find outstanding about \$65,000 of securities per mile of road operated. This is probably very much smaller than the actual investment per mile in the property. Since the credit of the Delaware & Hudson is so high as to permit of the sale of 4 per cent. bonds at a reasonable figure, and since the volume of the securities issued against its investments is so conservative, and further, since nearly twothirds of its securities are represented by funded debt, the final return on the stock representing the ownership of the company is high. In 1913 the company earned 14.53 per cent., and paid 9 per cent. in dividends on its stock, and in 1912 it earned 12.95 per cent. and paid 9 per cent. It must be remembered, of course, that these figures represent the earnings from all sources, including the profits on coal mined and the dividends on stocks and the interest on bonds of electric railway companies and other companies in which the Delaware & Hudson has a considerable investment. The net railroad income amounting to \$4,927,000 is at the rate of a little over 8 per cent. on our estimated capitalization against the railroad property-\$65,000 per mile.

Letters to the Editor

STEEL CAR INSULATION

New York, July 3, 1914.

To the Editor of the Railway Age Gazette:

In order to correct impressions or conclusions that might be reached after reading the article appearing in your issue of June 26, "Heat Transmission Tests on Steel Mail Car Section," we desire to submit the following:

As stated in the article, these tests were limited. They do not cover or give results that would aid in determining the correct steel car insulation. In the first place, before making laboratory tests it is customary to secure only material first class in every respect; it will be noted in Fig. 2 that almost all the four panels show the insulation torn, damaged or pieced together, and on one side of the box the insulating material is cut into two sections. This would allow an open joint, which would not be the case with insulation as applied in a car, as it would be cut in one sheet, eliminating radiation through open joints.

It would also seem that the best results would be obtained if all sides of the test box were of exactly the same construction, instead of having one side of steel and the others of wood. The study of steel car insulation problems is one that has been given considerable thought ever since the inception of the all-steel design, and there are certain conditions which must be considered but which appear to have been overlooked entirely in the tests conducted by Prof. Willard. Steel car insulation should have the following properties:

- 1. Highest insulation efficiency.
- 2. Correct sound absorbing properties.
- 3. Flexibility, ease of application and adaptability to irregular surfaces.
 - 4. Light weight.
 - 5. Moisture repelling or absorbing qualities.
 - 6. Combustion resistance.

The test in question has eliminated almost all of the above with the exception of insulation efficiency. A great many insulation tests have been made by almost all the large laboratories as well as testing laboratories of different universities, but one report that has been given considerable prominence is that prepared by Prof. J. A. Moyer, in charge of the thermal testing plant of the Pennsylvania State College, read before the Third International Congress of Refrigeration, Chicago, 1913. One of the largest and most elaborate thermal testing plants in the country is installed at this college. The efficiency of granulated cork shown in Mr. Willard's paper does not agree with Prof. Moyer's, as the latter shows 1 inch granulated cork to have a B. t. u. transmission per square foot per hour per degree Fahrenheit difference in temperature of air as .479 and of 1 inch hair insulation as .31.

Prof. Moyer's test also brought out a 5 per cent. increase in B. t. u. transmission per 100 feet per minute velocity over 200 feet per minute; at 20 miles per hour this means an increased transmission due to increased air velocity amounting to 75 per cent. This clearly shows the difference existing between a test made in still air and one made under actual operating conditions on a railroad. Insulation efficiency depends upon dead air spaces, and under Item 3, "Object of Tests," in Mr. Willard's article, there is a statement that the space between the inside and outside plates would be filled with a granular or fibrous material which would render that space dead. Those familiar with steel car construction will readily agree that it would be almost impossible to make a dead air space, owing to the openings between riveted joints, around windows, etc. The only possible way to obtain dead or entrapped air spaces is by the use of a material that will actually give this.

The article in question does not clearly describe the kind of

granulated cork used, but from the extremely light weight, six pounds per cubic foot, we assume it is made of large granules of baked cork and its insulation efficiency would be greatly questioned, as this particular material is the sawdust from pure cork sheets, trimmings, broken sheets ground up, etc., after the cork has been baked; and unless the interstices existing between the granules of the cork were filled with a fine re-granulated material the insulation value would not be very high in actual practice. Granulated and re-granulated cork is sometimes used in cold storage work, but it has been found that the material tends to pack and in building work a space is usually left so that additional material may be added upon settlement of the original quantity. It would be almost impossible to take care of this condition in steel cars; and unless the insulation was continuous it would allow uninsulated portions of the steel plates to exist, which would be liable to cause condensation, thus further reducing the efficiency of the insulation. Nor would very fine re-granulated cork answer the purpose in attempting to obtain the required insulation efficiency in all-steel cars, as it would filter down into the interior of the car body over window curtains, etc.

In regard to cork insulation showing a 28 per cent. saving in weight: This amount is so small it is hardly worth notice, for when it is considered that a steel postal car weighs approximately 100,000 lb., figuring on the basis of 3,000 sq. ft. of insulation per car at an average weight of eleven ounces per square foot, it would mean a saving of only about 580 lb. per car, approximately one-half of one per cent. of the total weight of the entire car, which is really not of enough importance to warrant serious consideration.

It would seem from the tests that the insulation was of the well known Salamander brand. Such is not the case, however, as it was a special material known as "Nycinsul." Three-quarter-inch three-ply Salamander steel car insulation weighs only eleven ounces per square foot, whereas ¼-inch and ½-inch Nycinsul weigh eleven and sixteen ounces, respectively, making a weight of twenty-seven ounces per square foot of material for both courses. Figuring on using two courses of ¾-inch three-ply Salamander, we would have a weight of twenty-two ounces per square foot for both, or a saving that would offset the use of granulated cork in the entire air space.

There is nothing new in the suggestion to fill the wall spaces of the car solid with an insulating material. This has been tried on one or two occasions by large railroads, and it has been found to increase the insulation efficiency by 20 per cent.; but by the correct use of doub!e insulation and combinations thereof, almost exactly the same results can be obtained.

The question of sound-deadening is one of prime importance in steel car design; and it has been ascertained that with the Salamander form of hair insulation, cars are much less noisy than is the case with those insulated with a harder and more dense material. This type of material is used in remedying the acoustics in offices, auditoriums, schoolhouses, court houses, etc., the treatment being worked out along purely scientific lines, hair being found to reduce the reverberations of sound to a minimum.

In regard to the test showing that by eliminating the use of the Agasote fibrous blocks between the steel posts and the inside and outside steel plates: This does not seem to be reconciled by other results or good engineering practice, as it has been long recognized that it is better to break the continuity of the steel plates by the use of ¼-inch asbestos felt, cork board or Agasote. This also tends to reduce radiation through steel post sections. If this is not done the steel sheets have a tendency to sweat, the same as cold water pipes running through a hot room.

A number of the largest railroads in the country have made operating insulation tests that have proved clearly the correct insulation material to be used; and we know the development of this part of the all-steel car has kept pace with other parts of the design and is really one of the things that have done much to facilitate the adoption of the steel passenger equipment car.

H. W. Johns-Manville Companya

New York, July 7, 1914.

To the Editor of the Railway Age Gazette:

Referring to the article appearing in your issue of June 26, under the heading, "Heat Transmission Tests on Steel Mail Car Section." Comparing tests 2-A and 2-B with 3-A, 3-B and 3-C, the former with the fibre insulation between the posts and inside sheets, and the latter with the fibre insulation separations omitted, the fibre insulation combination is shown to have an insulating efficiency of 40 per cent., while, by omitting the fibre insulation, the efficiency is increased to 47 per cent. This is diametrically opposed to any heretofore known facts of heat transmission. It may develop that in tests 3-A, 3-B and 3-C the plates were not firmly in contact, as a casual reader might be led to infer that heat transmission through 3/6-in. rivets does not seem sufficient explanation for the difference.

It seems to me quite unusual that agasote should be subjected to such a comparison, when it has long been known to possess insulation values practically equal to wood, as demonstrated in actual service and through exhaustive laboratory tests conducted by Prof. Pryor, of Stevens Institute, and others. For the comparative test between agasote and wood Prof. Pryor selected three-ply poplar veneer, 5/16 in. in thickness, and thoroughly seasoned, as he believed thoroughly dried poplar to have the highest thermo-insulation properties. This material, being a veneer, had higher insulation properties than a single thickness, where the grain runs in only one direction throughout the board, as, in a veneer, the grain runs in various directions, thus breaking the direct transfer of heat units. The results of his test are as follows:

Three boxes, cubes of equal size, were made of different materials, one of No. 20 gage steel, one of Agasote, and one of 5/16 inch 3-ply veneer poplar. Each of these boxes was made with a removable cover.

The tests consisted of determining the amount of heat that had to be supplied to the air inside of the box in order to keep the internal temperature about forty degrees higher than the temperature of the room. That is, heat was supplied to offset the heat lost through the walls of the box when there was a difference of temperature of forty degrees between the outside and inside temperature.

The boxes were set up in the still air of a room having a temperature of about 85 F. A number of incandescent lamps and a slow moving circulating fan were placed inside of the box to maintain a uniform temperature, approximately forty degrees higher than the room temperature. The amount of heat furnished by the lamps was regulated by an adjustable resistance placed outside. Calibrated instruments were used to find the electrical energy that was supplied to the boxes, and this quantity was transformed mathematically to heat units. The temperature inside the box was note! and maintained by observing thermometers that were inserted through the side walls. The outside temperature was also obtained by thermometers hung about the boxes. The boxes were sealed as tight as possible in order to keep down the air filtration.

It was found in the tests that the transmission value of the material: was, based on steel being 100, as follows:

Steel .										. ,									100.0
Agasote															 				62.51/4
Wood,	hr	ee-	ply	7	po	pl	ar												51.2 5/16

The detailed figures of the tests, showing the actual temperatures and heat transmissions, are given in the following table:

Boxes in Still Air

Designation of material		Steel .	Agasote	Woo !
Radiating box surface, sq. ft		38.5	39.4	39.2
Heat supplied per hour, watts		555.9	366.2	295.2
Heat supplied per hour, B. t. u	18	396.7 1	249.5	1007.2
Average inside air temperature, deg. F		126.5	121.8	126.3
Average temperature of external air, deg. F		87.2	81.3	86.3
Difference in temperature between inside a	r and			
external air, deg. F		39.3	40.5	40.0
Radiation per hour in B. t. u.'s per deg. F.	differ-			
ence between inside air and external air,	B. t. u.	48.3	30.8	25.2
Radiation per hour in B. t. u.'s per deg. F.	differ-			
ence between inside air and external ai	r, per			
sq. ft. (based on box surface), B. t. u		1.253	0.783	0.642
Ratio of performance (based on box surface) 1	0.00	62.5	51.2
	THE I	PANTASO	TE COM	PANY

RAILWAY CONSTRUCTION IN RUSSIA.—The Vladikavkaz Railway of Russia is at present considering the construction of a new line for the purpose of connecting up the Ekaterininsky system with the Vladikavkaz Railway. The project will involve a capital expenditure of about \$1,000,000. The company is also proposing certain improvements and extensions at Novorossisk to cost about \$750,000 mill edit to 1 axes.

The New York Central's Improvements at Utica, N. Y.

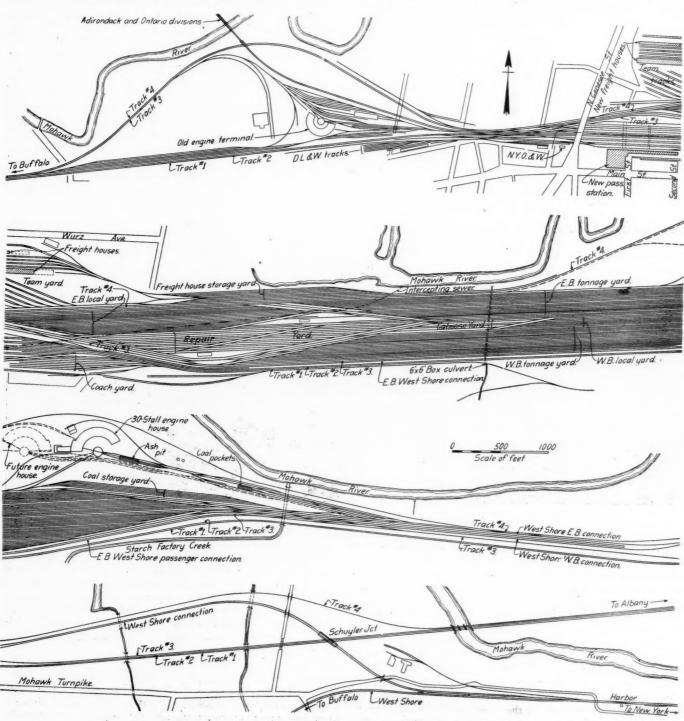
THE WASTER

Construction of New Passenger Station, Freight Houses, Classification Yards and Engine Terminal

The New York Central & Hudson River's new passenger station at Utica, N. Y., opened on May 24, is one of the important features of the extensive improvement work that this company has been carrying out in Utica for several years and which, when completed, will represent an estimated investment of \$6,000,000. Utica is an important point, both for freight and passenger traffic, on account of its location on the main line between Albany and Buffalo at the junction with the West Shore, the Ontario and the Adirondack divisions. About 30 passenger trains are operated in each direc-

tion daily from Utica on the main line and about 12 on the other lines. The total daily car movement into and out of the Utica freight yard was shown by a check made last summer to exceed 1,100 cars. The distribution of this freight business is shown in the accompanying traffic diagram.

As the West Shore is electrified and operated by a separate company west of Utica, all freight except for points in electrified territory is handled over the main line west of that point. East of Utica either the main line or the West Shore may be used for freight traffic, connections at Utica, Hoff-

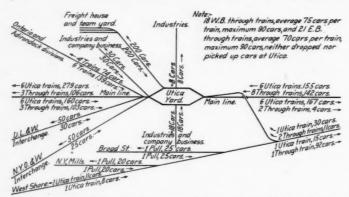


General Layout of the Ultimate Yard Development at Utica, Only a Portion of Which Has Been Built

mans, and Carmen making the operation quite flexible. A large amount of business between New York and Montreal also passes through Utica. Practically no classification of through freight is made at Utica, but all local business and all transfer freight from the West Shore, the Watertown line, the Adirondack division and foreign roads must be classified there.

NATURE OF THE IMPROVEMENTS

As substantially all of the city lies to the south of the main line, the company negotiated with the city for the straighten-



Diagrammatic Daily Car Movement Into and Out of Utica Yards

ing of the channel of the Mohawk river immediately adjacent to the old layout on the north, to remove that obstruction to development of the terminal facilities. An agreement was finally reached under which the city constructed a new river channel about 2,000 ft. north of the main line and the New

two street railway tracks. Two 8 ft. sidewalks are supported outside of the outer trusses. Three-column steel bents on concrete footings, with reinforced concrete collision piers connecting the lower ends of the columns, carry the trusses. The plate girder floor beams and I-beam stringers support reinforced concrete slabs on which the pavement is laid. All steel work with the exception of the girders above the curb is encased in concrete. Concrete facia girders are provided along the outer edges of the sidewalks.

The new local freight facilities are grouped north of the passenger terminal east of and easily accessible from Genesee street. Separate inbound and outbound freight houses of brick construction are provided, the former being 50 ft. wide and 760 ft. long and the latter 30 ft. wide and 500 ft. long. Room for additions of 200 ft. to the length of both houses is provided at the east end of the layout. Eight tracks serve the houses. The team yard contains 14 tracks with a total capacity of 171 cars. These tracks are arranged in pairs with 30 ft. paved driveways between the pairs. There are two additional team tracks of 20 cars capacity each outside of the north station driveway, supplied with a platform and ramps for handling automobiles.

As the new passenger station covers the site occupied by the old station, it was necessary to provide a temporary building for use during the erection of the new station before the old building was torn down. This was located along the north side of the proposed station platform layout with a temporary framed trestle ramp connecting with the Genesee street viaduct. The three northerly platforms serving six station tracks and the north half of the passenger subway were also built before the old station was abandoned.

During the construction of the new passenger facilities,



A Portion of the Team Track Yard and East-Bound Local Yard

York Central purchased the excavated material at a fixed unit price to be used in refilling the old channel. A large outfall or intercepting sewer was necessary in order to carry out this agreement, running under the passenger and freight yards to the river about one mile east of the station.

The next step was the elimination of grade crossings in the vicinity of the station. This involved the closing of Park avenue east of the station, the construction of a new street along the north side of the proposed new layout to connect Genesee street with the extension of Park avenue, and the elevation of Genesee street on a viaduct crossing the main tracks. This viaduct consists of one 40 ft. girder span and five truss spans, varying in length from 70 ft. to 87 ft. Three lines of girders and pony trusses are used in these spans, carrying a roadway 45 ft. 6 in. wide in which are laid

work was being pushed on the construction of a "jump-over" connection between the West Shore and the main line about 3½ miles east of the passenger station, and on the new classification yard and engine terminal located between that jump-over connection and the passenger terminal. This work involved the construction of a number of minor structures and the handling of large quantities of excavation. The following table indicates the magnitude of the operations that were undertaken:

Items	Old terminal	Present construction	Ultimate development
Right of way. Grading excavation Masonry culverts Cast iron pipe. Main track	2,400 yd. 75 tons 18 miles	728 acres 6,400,000 yd. 13,200 yd. 365 tons 18.5 miles 27.1 miles	7,500,000 yd. 370 tons 22.8 miles 57.8 miles
Yard tracks		45,6 miles	80.6 miles

JUMP-OVER CONNECTION AND YARDS

The old single track connection between the West Shore and the main line at Harbor, where the two lines are only about 600 ft. apart, required freight trains to pass over a heavy grade and to drag through crossovers on the twopassenger tracks which are on the south side of the four-track main line. To improve this condition, a double track jumpover connection has been built leaving the West Shore just west of Harbor, crossing the main line overhead and swinging around parallel with the main line east of the main freight yard. The maximum grade on this new connection is 0.25 per cent. compensated. Track 4 is diverted to the north a short distance east of the jump-over connection and is carried north of the entire yard development and engine terminal. Track 3 has been relocated to separate it somewhat from tracks 1 and 2 and place it on a grade which will allow easy connections with the yard. Tracks 1 and 2 are diverted to the south of the yard layout and are carried on a separate embankment for the greater part of their changed length.

The ultimate yard development as planned at present, includes nine yards of the following capacities:

Trac	ks Capacity
Eastbound tennage yard	2,200 cars
Westbound tonnage yard	2,200 cars
Eastbound local freight yard	
Westbound local freight yard 8	640 cars
Repair yards	380 cars
Freight house and team track storage yard	300 cars
Coal storage yard	300 cars
Coach yard	
Caboose yard	90 cabooses
Total capacity	7,188 cars

This capacity is in excess of the present demands and it is expected that sections of the yard will be built as required

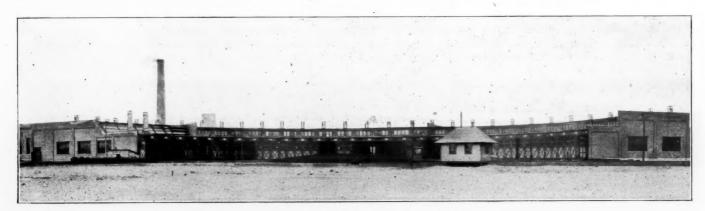
and team outfits were used for making the high fill under the jump-over connection and other miscellaneous grading work.

Starch Factory creek which crossed the yard site, has been diverted to the east in order to shorten the length of the required culvert. This creek is carried under the yard in a 24 ft. concrete arch culvert. A 6 ft. by 6 ft. concrete arch has also been built near the middle of the yard. A three-story frame yardmaster's office and four interlocking towers are also provided. An electric transmission line which crossed the site of the yard had to be relocated to keep it north of the new development and a new crossing has been constructed on steel towers with a maximum height of 98 ft.

The tracks in the main yard are laid on 12 ft. centers with a 16 ft. space in the middle of each of the tonnage yards and between adjacent yards, for piling material, rubbish, etc. An 18 ft. to 20 ft. spacing is standard along ladder tracks, leads and thoroughfares. The tracks in the repair yards are spaced alternately 16 and 20 ft., with two adjacent ladders through the center of the yard, dividing it completely. No. 8 frogs on No. 7 ladders are used for all of the principal yards and No. 10 frogs are the sharpest used on running tracks and main line connections. Main line tracks are laid with 105 lb. rail and yard tracks with 80 lb. relaying rail. Creosoted ties and gravel or cinder ballast are used.

At present the only main line trains that change engines at Utica are tonnage freights and local passengers. For these trains and for the Ontario and the Adirondack trains about 54 engines per day are turned at Utica.

The engine house consists of 30 stalls built on a 70-stall circle with provision for the addition of the same capacity



General View of the 30-stall Roundhouse

and if conditions change the plans will doubtless be altered before the completion of the development. Ample room has been left for extensions and changes wherever the possibility of such changes could be foreseen. The yards are served by an ample number of both thoroughfare and engine running tracks.

A large portion of the filling material for the yard and jump-over connection was obtained by hydraulic dredging. Two field towers, one 95 ft. high and one 65 ft. high, operating drag line buckets were used to throw up a dike behind which the hydraulic fill was made. A 20 in. suction dredge with a 40 ft. by 138 ft. hull, equipped with a 750 h. p. engine, a 1,000 h. p. boiler and a 50 ft. ladder, was used on this work. This dredge pumped through pipe lines 800 ft. to 4,600 ft. in length against a maximum head of 35 ft. The material handled contained from 18 to 22 per cent. of solids. This dredge was able to handle 19,400 cu. yd. in 24 hours. A size "B" Lidgerwood dipper dredge was also used for portions of the work, its maximum record being 18,000 yd. in three 8-hour shifts. This dredge was equipped with a 2½ yd. bucket and an 80 ft. boom. A 65-ton Bucyrus steam shovel

in a separate house adjacent to the present one. The depth of 25 of the stalls is 100 ft., and of five, 125 ft. Three drop pits are provided in the long stalls, making it possible to remove any wheel from any engine using the house. A 7-ton electric hoist handles the wheels from these drop pits. The house is a brick structure on concrete footings, similar in type to the generally adopted New York Central standard. The engine terminal also includes a machine shop power house, fan house, two double track ash pits 200 ft. long, two inspection pits 80 ft. long, a gravity coal trestle, sand house, two 50,000 gal. wooden storage tanks and four penstocks.

The power house is a brick building 75 ft. by 89 ft. in size. The machine shop is located in an annex building connecting with the long stalls over the drop pits. The coaling trestle is arranged to coal engines on two tracks directly from the pockets and by means of a bridge reaching over to track No. 4 engines can also receive coal on that main track. Clearfield coal is used for freight engines and Pittsburgh coal for passenger engines, provision being made in the pockets to keep these grades separate. The pockets are 160 ft. long and are reached by a trestle on a 5 per cent. grade.



* The Recently Completed Passenger Station

NEW PASSENGER STATION

by 204 ft. in plan, facing on Main street and on First street, one block east of Genesee street. First street ends at the tracks and provides an entrance to the trucking space along-

side the baggage and express building, which extends from The new passenger station is a three-story building 192 ft. the passenger station east to Second street. The front of the station is set back from the street line 18 ft. There are two main entrances on the front covered by heavy marquises. Auxiliary entrances are also provided on both sides of the

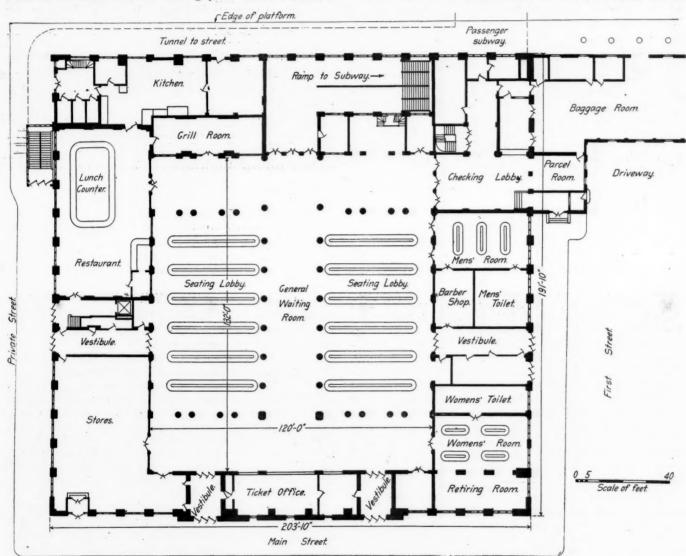


The Main Waiting Room in the New Station, Showing Vaulted Ceiling Over Passageway and Beam and Skylight Ceiling Over Seating Lobbies

building. Structurally the station has a steel frame with Bedford stone facing up to the first office floor and grayish rough textured brick for the remaining height. Limestone trim is used throughout. Architecturally the building is of the Tuscan order with only enough ornamentation to relieve the severity of the lines. The first story supports a colonnade of Tuscan columns, between which are placed the window openings for the second and third stories. The colonnade is surmounted on the Main street side by a clock 6 ft. 6 in. in diameter supported on either side by cut stone eagles.

The building was designed to rest on spread footings without piles, but as a water-bearing sand was encountered in the excavation, it was decided to use piles under all foundations. A Thew steam shovel was used in excavating for the building and subways, and by rigging a set of leads on this machine it was also used for driving piles. As the street in marble columns into a central and two end passageways and two seating lobbies. The central passageway continues to the north wall of the building where a connection is made with the passenger subway. Each seating lobby contains six double seats. The total capacity is about 400 people. All facilities for handling passenger business are grouped around this main waiting room, including the ticket office, information booth, the women's rooms, barber shop, men's rooms, parcel room and baggage check room, news stand, grill room, restaurant and lunch room. A large rental space, which will be occupied by a store, is located in the southwest corner. The floors in the main waiting room, men's rooms and restaurant are of terrazzo, in the vestibules and ramp leading to the subway of paving tile, in the women's rooms of cork tile, and in the grill room of quarry tile.

The effect of ornamentation has been secured in the in-



Ground Floor Plan of New Passenger Station at Utica, N. Y.

front of the station and the new track level are at approximately the same grade, the main floor of the station on which all public facilities are grouped is kept at approximately the same elevation, and access to the train platforms is provided by a subway under all the tracks connecting by a ramp and a short flight of stairs, with the main waiting room in the station and to the street at the west side of the building, allowing incoming passengers to reach the street without passing through the station, if desired.

The two main entrances on the south front of the building open through enclosed vestibules directly into the main waiting room, which is 120 ft. by 132 ft., divided by rows of

terior of the building chiefly by the skilful treatment of permanent materials. Vermont marble of soft gray and green veining has been used throughout for wall facing and columns. The vaulted ceiling over the main isles and the paneled ceiling over the seating lobbies are tinted with a grayish green shade to harmonize with the marble, the relief ornamentation being picked out in dull Roman gold. The woodwork is of oak throughout. The building is heated by steam furnished by three 150 h. p. boilers, located under the baggage house.

The building contains two main office floors, and provision has been made for two elevators, one of which has been in-

stalled. The floors in the office portion of the main building are of steel and concrete construction, the corridor floors being finished with a cement surface and the offices with wood. The partitions are of gypsum blocks and the structure is made fireproof throughout.

The baggage house is a brick building with limestone trim. It is 604 ft. long and 36 ft. wide. It includes a baggage room, mail room and offices and storeroom for the National and American Express Companies.

The track layout at the passenger station includes 12 station tracks served by six platforms, 20 ft. wide and with a maximum length of 1,200 ft. Two through tracks for fast freight and passenger trains which do not stop at Utica are carried through the middle of the layout and are not adjacent to any platforms. The platforms are covered with canopies, 600 ft. long, with provision for extension over the full length of the platforms. Each platform is reached by two stairways from the passenger subway below and by an elevator from the baggage subway.

The passenger subway is 30 ft. 5 in. wide and 8 ft. high with a center row of columns supporting the roof. The walls are of concrete founded on piles and faced with hard burned face brick. The roof consists of concrete slabs under the platforms and I-beams supporting transverse concrete slabs under the tracks. The ceilings under the solid slabs are of sheet steel painted white. The subway is provided with seats along both walls where passengers can wait until trains are called, and if desirable, two rows can be added between the center columns. Heat is supplied by direct radiation under these seats. The electric lights are suspended from wall brackets.

This entire improvement work was carried out under the direction of the engineering department of the New York Central & Hudson River, G. W. Kittredge chief engineer; C. J. Parker principal assistant engineer; J. W. Pfau, engineer of construction, exterior zone; E. B. Menuez, district engineer; B. C. Martin and G. F. Chism, resident engineers, and R. T. Horton, assistant district engineer, had resident charge of the work at various times. James H. Dawes (New York State Dredging Corporation), Philadelphia, had the contract for all grading work on the general improvement. The high fill under the jump-over connection was let to the Walsh-Kahl Construction Company, Davenport, Iowa. Henry R. Beebe, Utica, had the contract for the construction of subways, platforms, canopies, temporary passenger stations and numerous details. The passenger station was designed by Stem & Fellheimer, New York, and was built under contract by J. Henry Miller, Inc., Baltimore, Md. The freight houses were built by Mosier & Summers, Buffalo, N. Y., and the engine house by James Stewart & Company, New York. All tracks were laid with company forces.

FAST TRAINS ON A GERMAN RACK RAILWAY.—On the Höllentalbahn (Hellvale Railway), between Freiburg, in Baden, and Donaueschingen, international through cars are now run at relatively high speed for the service between Mülhausen, in Alsace, and Ulm and Munich. Freiburg is situated in the low plains of the middle Rhine, not far from Basle, where the Rhine makes a bend, just at the foot of the Schwarzwald; the Höllental rack railway leads into the highest part of the Black Forest mountains, which there rise to 5,500 ft. The length of the Höllental section of the railway is 22 miles, and the rack line itself has a length of 4.3 miles, and passes over gradients of 55 in 1,000, and curves of 240 ft. radius. Since 1908, through trains of 62 tons maximum weight have been run over this section. Since the summer of 1912, trains of 121 tons weight have been run on the rack at a speed of 19 miles an hour, while the speed over other parts of the Höllental line is 32 miles. The trains are hauled by tender engines of 63.5 tons weight, fully equipped, and special rack locomotives act as helper engines on the rack section.

SOUTHERN RAILWAY PROGRESS

The trustees of the voting trust certificates of the common and preferred stock have sent a letter to stockholders in which they comment on the growth of the property during the life of the voting trust. The following figures are taken from this letter:

	1913	1895	Increase	Per cent.
Mileage	7.037	4,392	2.645	60
Gross revenue \$6	9,676,720	\$17,114,792	\$52,561,928	307
Gross revenue per mile	9,903	4,135	5,768	139
	1,221,685	5,141,615	16,080,070	319
Gross income per mile	3,016	1,242	1,774	142
Ded, from inc. (exc. divs.), 1	4,191,721	4,245,870	9,945,851	234
Ded. per mile	2,017	1,025	992	96
Net income	7,029,965	895,745	6,134,220	684
Net income per mile	999	216	783	361
Ton m., revenue fr4,57	7,486,801	1,098,932,884	3,478,553,917	316
Ton ms. per ms	650,617	265,479	385,138	145
Fr. revenue per mile	6,388	2,613	3,775	144
	4,801,198	178,015,925	666,785,273	374
Pass. ms. per ms	120,075	43,005	77,070	179
Pass. tr. revenue per m	3,118	1,349	1,769	131
Double track m	385			
Locomotives	1,632	623	1,009	161
Pass. train cars	1,157	487	670	137
Freight train cars	49,512	18,924	30,588	161

Expenditures have been made for additions to the company's property from 1894 to 1913 to the extent of over \$124,000,000 as follows:

New equipment	\$35,539,829
Double track, terminals, yards, heavier rails, etc	44,263,176
Real estate—right of way	3,869,041
New lines and extensions	10,731,421
Betterments through inc., approximately	30,000,000
Total	124 402 465

Growth of the investment and of the financial resources of the company is indicated by the following figures:

Property investment:	1913	1895
Road Equipment Securities Materials and supplies. Advances to proprietary cos.	\$307,962,970 65,502,224 68,151,367 5,744,876 408,235	\$228,639,979 6,010,803 7,609,801 919,430
Total	\$447,769,673	\$243,180,013
Per mile of road owned	\$103,481 67,331	\$85,565 55,992

During the period the company has paid aggregate dividends on its preferred stock amounting to \$30,758,904, equal to an average of 2.76 per cent. per annum.

Records of the company's land and industrial department show that from 1900 to 1913, inclusive, 8,337 new manufacturing plants of various kinds, representing an investment aggregating \$500,000,000, were located on the lines of the Southern Railway. During the same period additions were made to 2,486 existing factories amounting to \$100,000,000.

The states principally served by the Southern Railway are nine in all—Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky and Tennessee. In 1910 the population of the South as so defined was 17,554,840, an increase in twenty years of 4,471,933 or 34.18 per cent.

The last available census figures of the value of property in the South compare 1904 with 1890, and show an increase in wealth in those fourteen years in these southern states of \$2,373,242,026 or 38.12 per cent. Farm property in the same states increased in value, comparing 1910 with 1890, in the amount of \$2,505,340,373 or 128.08 per cent., while the capital invested in manufactures in the same states in 1909 shows an increase over the year 1889 of \$1,075,325,534 or 278.71 per

Value of farm crops in the South in 1909 was \$1,199,424,319, an increase of \$605,580,746 or 102 per cent. over 1899. Value of products of manufactures in 1909 was \$1,455,927,000, an increase in the same period of \$939,113,553 or 181.71 per cent. Comptroller of the Currency reports bank deposits in the South in 1910 as \$677,483,913, an increase of \$435,316,983 or 179.76 per cent. over 1900.

"The share which Southern Railway Company has had in this prosperity is notable," says the trustees' letter.

The Draft Gear Problem from Various Viewpoints

First Prize Article and Two Others Presented in the Railway Age Gazette Mechanical Edition Competition

FIRST PRIZE-THE DRAFT GEAR PROBLEM

By E. W. NEWELL Mechanical Engineer, Pittsburgh, Pa.

Draft gear—the real meaning of which is "an apparatus used for drawing a load"—when applied to railway equipment becomes not merely a pulling mechanism, but a shock absorber as well, and owing to the limited space allotted for its installation and the short movement through which it performs its work, the design, principle of operation and installation make it one of the most important, if not the greatest problem, confronting the engineer and designer of railway equipment.

The demands of modern railroading require the stopping of a heavy, high speed train in about one-quarter of one minute, but the draft gear is expected to protect from injury the coupler, the car and its lading, in one-sixth of one second at the very low speed of one mile per hour and in proportionally less time at higher speeds.

It is not our purpose to go into elaborate statistics regarding the number of cars continually out of service on account of defective draft gears and attachments, or to give figures showing the high stresses to which the draft gear is subjected, but to describe the different methods which have been used to meet these conditions and to give results of laboratory and road tests, together with car repair records in order to show which principle, in the designing of draft gears, has proved to be the most efficient.

Various means, including the compression of liquids and air, have been employed to dissipate the shocks on railway vehicles, but the only devices which have been found practical are compression springs and a combination of springs and metallic frictional members, known as friction draft gear; the comments which follow will be confined to the merits of the spring and friction draft gears.

SPRING DRAFT GEAR

Since the discovery of metals, springs of different forms have been used as a cushioning medium and it was natural that they should have been selected for draft gear purposes in the early days of railroads. So long as railway equipment was of light construction, the trains short, and the speeds moderate, spring draft gears were satisfactory, but as these conditions changed, the light springs were found inadequate and those of higher capacity were substituted.

The increased capacities and weights of railway equipment, together with the general use of air brakes on freight trains, permitting higher speeds and longer trains, necessitated a still further increase in the capacity of the springs, and to such an extent that disastrous results occurred from recoil. If it were not for the reactive effect, the use of springs as a shock absorber would be an ideal arrangement on railway trains, because the power required to compress a spring is in direct proportion to its movement, and this is about the rate shock stresses should be dissipated to give the best results.

The damages resulting from the recoil of draft springs is most severe on cars in transit, not only to the lading, but to couplers and attachments and other parts of the car. The danger of parting long trains equipped with spring draft gears and running at slow speeds is so great if the throttle is opened immediately after placing the handle of the brake valve in release position, before all brakes are fully released, that locomotive engineers rarely attempt it and some roads issue instructions forbidding it.

The capacity of draft springs is limited to their safe recoil effect, which is also the capacity of the springs to resist buffing stresses; it has been found to be only about one-third the capac-

ity of a friction gear which does not have the damaging recoil results of the springs.

SERVICE RESULTS

The limited capacity of draft springs gives but a comparatively slight protection to heavy equipment in buffing; this fact was very forcibly brought to the writer's attention a few years ago, when inspecting a lot of cars at the request of a railroad official. Three years previously the road had purchased five hundred cars, alike in every respect except that one-half were equipped with spring draft gears and the other half with friction gears. After having been in the same service for the above length of time, all the cars were reported to be in excellent condition. The railroad was about to purchase additional cars and contemplated using spring draft gears, as the cars equipped with this device were apparently in just as good condition as those fitted with the more expensive friction device. The cars referred to were steel hoppers and their use was confined to ore service. The steel end sills were strengthened on the outside by a very heavy steel casting extending the full width of the car, the casting being so arranged as to take the final blow of the coupler horn. An inspection of many of the cars with both types of draft gears showed them to be in excellent condition, but a visit, the following day, to the repair tracks (the best place to obtain practical draft gear information) revealed a condition which proved conclusively the superiority of the friction gears over the spring

From the repairmen the writer learned that the 250 cars equipped with friction gears were still using the couplers which were applied when the cars were built. On the 250 cars equipped with spring gears all the original couplers had been broken, as well as a complete renewal of another make and at the time of the investigation all of the spring draft gear cars which came in for coupler failures were being equipped with still another make, in the hope that the last type of coupler would be better than the other two. They failed to realize that the trouble was due to the end sills being so strong and the capacity of the spring draft gears so low that the coupler head was continually being driven against the end sill until it broke.

If railroads would keep accurate and systematic records of expenditures and replacements of repairs to freight cars, separating the cost of draft gear maintenance from general repairs, there would be many revelations similar to this.

From experience in car design and inspection of failures of different parts of railway equipment, together with the information obtained from reading railway literature and papers before our railway clubs, there is no question (and it seems to be corroborated by all published reports) that the enormous expense of car maintenance, damage to lading, delays from break-in-twos, etc., would be materially reduced if friction draft gears, properly applied and maintained, were standard on all railways. To be more emphatic, the universal use of friction gears would show as great improvement in conditions as the change from link and pin connection to the present M. C. B. coupler.

LABORATORY TESTS OF DRAFT GEARS

Much time and space could be taken by presenting figures and charts of tests of draft springs on static testing machines and under falling weights, from the early tests under the M. C. B. drop of 1,640 lb. to the present schedule of drop and rivet shearing tests under a 9,000 lb. weight, but these results have been published so generally and are so well known that a rehearsal of this data is unnecessary. Drop test efficiencies of spring and friction gears may be briefly summed up by the following statements, which are results of demonstrations made at various

times, under the auspices of railroad officers, and which are matters of common knowledge among railroad mechanical men:

(a) A 9,000 lb. weight falling 51/2 in. closes the most powerful draft gear spring solid.

(b) A 9,000 lb. weight is required to drop from 15 to 20 in. to close solid a friction draft gear of ordinary capacity.

(c) The above draft gear springs placed upon a follower, supported by two standard draft lugs, attached to channels by nine 9/16 in. rivets in each draft lug, required 15 blows of a 9,000 lb. weight falling 6 in., and one blow from a height of 9 in., to shear the rivets.

A friction draft gear, under the same conditions, before shearing

the same number of rivets, required:

15 blows of a 9,000 lb. weight falling 6 in. 15 blows of a 9,000 lb. weight falling 9 in.

15 blows of a 9,000 lb. weight falling 12 in.

15 blows of a 9,000 lb. weight falling 15 in. 12 blows of a 9,000 lb. weight falling 18 in.

ROAD TESTS OF DRAFT GEARS

There are many who do not consider laboratory tests of much importance, because of the conditions being so different from service. For this reason there have been made, in different parts of the country, several draft gear demonstrations, with fifty car trains equipped with spring and different forms of friction gears. The two most important tests of this kind were the Santa Fe tests at Ft. Madison, Ia., in 1906, and those on the Los Angeles division of the Southern Pacific in 1908. In order to illustrate the comparative service operation of spring and friction draft gears, a few results of the demonstrations on the Southern Pacific (see report published in serial form in the Railway Age Gazette, and the Railway and Engineering Review, December, 1908) are given below.

JERK TEST

Set 10 rear brakes by air, take slack with full throttle and throw reverse lever ahead; engine worked on sand. (Train: 50 cars, dynamometer car the 41st.)

Spring Gear 260,000 lb. jerk

Friction Gear 120,000 lb. ierk

BUFF TEST

Emergency application of the brake at a speed of 91/2 miles an hour, steam shut off just previous to use of brake valve. (Dynamometer car 41st.)

> Spring Gear 550,000 lb. buff (One broken coupler)

Friction Gear 155,000 lb. buff (No damage)

RELEASE TEST

Accelerate train to 20 miles an hour, then apply brakes in service application and when speed has been reduced to 13 miles per hour open throttle of engine. (Dynamometer car 26th in train.)

285,000 lb. ierk (Train parted)

Friction Gear 156,000 lb. jerk (No damage; train kept moving)

BUMPING POST TESTS

In 1905-1906 a series of very interesting tests were made by a large railroad; the method employed showed in the best possible manner the inefficiency of spring draft gears. At the foot of a grade a substantial bumping post was erected, against which was anchored a dynamometer car. To the yoke of the coupler on the opposite end of the dynamometer car from the bumping post was attached a slide, containing the record paper, the buffing stresses from the striking cars being registered upon the paper, through the dynamometer, in the usual manner, the movement of the paper being coincident with the travel of the coupler. The diagrams showed the actual operations of the gears in the same manner that an indicator card illustrates what takes place inside of a steam engine cylinder.

During these bumping post demonstrations, tests were made with loaded cars to about 3 m. p. h. and with an empty car to 7 m. p. h. and the records showed the low cushioning effect of spring gears more accurately and clearly than any laboratory or road tests could do.

FRICTION DRAFT GEAR

The preceding comments relating to the inefficiency of spring draft gears disclose, in comparison, the superiority of the friction gear, which is admitted by all who have thoroughly and conscientiously investigated the draft gear question to be founded upon the best principle yet devised for dissipating the stresses to which railway equipment is subjected. The design of friction gears and the methods of operation have taken several forms, but unless some better principle than friction is discovered, friction draft gears, with possibly some modifications in design, will be used for many years to come.

Railroad mechanical men are often skeptically inclined towards the claims made by the makers of railway appliances, but it would seem that the friction draft gear manufacturers have done their part well in furnishing a device of such high efficiency, when it is considered that the spaces allowed for the apparatus are very limited and the travel (length of time for performing the work) is much less than it should be for dissipating shocks of such magnitude; and also to make it of sufficient strength, and at the same time as light as possible, so as not to increase the dead weight of the car.

The draft gear question today is one of close co-operation between the manufacturers of friction draft gear and the railroads, with especial care given to the proper installation upon cars, periodical inspections and renewal of repair parts when necessary. These suggestions, if put into practice, will undoubtedly result in more efficient service from draft gears and better protection to railway equipment and will assist greatly in answering that vital question which is worrying railroad officials so much today as to "how to reduce the cost of car repairs."

A REMEDY FOR DRAFT GEAR TROUBLES

By George THOMSON

Master Car Builder, Lake Shore & Michigan Southern, Englewood, Ill.

What is draft gear and what is it used for? This may seem a very useless question, yet if the truth is to be acknowledged we must admit that the draft gear is one of the least understood and most abused appliances on railroad equipment. The draft gear is, to state it plainly, the cushion between the back end of the coupler and the car, and is put there to protect the car from hard knocks; therefore, the better the cushion we use the more protection we give the car, which means a reduction in freight car trouble and the cost of maintenance. At present draft gear is distinctly divided into two kinds-friction draft gear and spring draft gear-there being different designs of each kind.

Until, probably, twelve to fifteen years ago the draft gear commonly in use consisted of one or two springs having a capacity of 19,000 lb. each. These springs were attached to the coupler and car in different ways. With the old type of link and pin coupler this type of gear proved fairly satisfactory, but with the advent of the automatic coupler came the rougher and more severe handling of cars in switching service, so that it was found that a more powerful gear or cushion was needed; then springs having a capacity of 30,000 lb. were brought into use. The attachments for applying the draft gear to the cars were also improved and made stronger. While these springs gave more protection to the car, it was also found that they had a very destructive recoil, which caused a great amount of coupler trouble, such as broken knuckles, knuckle pins and coupler locks; in addition, this rougher handling of cars also entailed a vast amount of trouble in the draft gear attachments themselves, such as broken yokes, yoke rivets, center sills, draft sills, end sills, buffer blocks and broken draft timber bolts. On box cars came an increase in bulged or broken ends, leaking and damaged roofs and side doors damaged and missing-all this increase of damage due to the more severe handling of equipment. A large amount of these troubles could have been prevented by the use of a draft gear giving more adequate protection.

Then came the steel underframe and all-steel car. On an allwooden car the cars had some "give" to them when hit hard enough, and, while this may have helped out the draft gear, it was pretty hard on the car. With a properly designed steel underframe, or steel car, these conditions changed and the draft gear had to take the bumps, as there is no "give" to the steel car. The capacity of the cars and the number of cars per train

were also increased. Heavier and more powerful locomotives came into use, so that in addition to the damage to cars and lading in switching yards came an increase in difficulties in handling long trains, such as break-in-twos, which is a very serious matter. A break-in-two means that not only the train itself is delayed while the damaged car is being switched to a side track, but it may also delay other trains, and very often cause wrecks. Men studying this question came to the conclusion that a more powerful draft gear was needed; but, while they wanted more draft gear capacity, it was preferable to obtain this without any increase in recoil; in fact, it was found highly desirable to reduce the recoil of draft gears. Therefore, this additional capacity could not be obtained by the use of springs alone for the very reason that every pound of energy used to close a spring is returned in the form of a "kick-back" or recoil.

After a great deal of experimenting, the friction draft gear was devised. In this type of gear the springs are not called upon to do all the work, as the frictional resistance is brought into use. This causes a large part of the energy delivered to the coupler by cars striking together to be used in overcoming the frictional resistance of the draft gear friction parts. Thorough tests show that, while it would take a large amount of energy to close a friction draft gear, it also has very little recoil. Friction draft gears have been tested in different ways and have proved their superiority over any and all forms of spring draft gear, this not only in laboratory tests but also in road and service tests.

Several railroads have at times fitted out test trains, equipping them with different types of draft gear, both spring and friction, and conducting a series of tests. These experiments proved beyond a doubt that the trains equipped with a good friction draft gear could be handled with greater despatch and with far less liability of break-in-twos than trains equipped with any form of spring draft gear. The shocks to which these trains are subjected due to train handling were accurately recorded by means of a dynamometer car.

The tractive effort of the locomotive has increased from the 50,000 or 60,000 lb. of several years ago to as high as 160,000 lb. on a large Mallet engine just built. A locomotive having a tractive effort of only 60,000 lb. is sufficient to close a spring draft gear solid, which leaves no cushion in the gear to take care of emergencies. All these facts tend to prove the need for a draft gear giving more protection.

The original friction draft gears had a travel of $2\frac{1}{2}$ in., whereas the spring draft gears have only $1\frac{3}{4}$ in. This increase in travel alone was of great benefit, and, added to the other desirable qualities of a friction draft gear, helped to solve a large number of the draft gear troubles. Since then various designs of draft gear have been placed on the market, some of them being widely used today, while others had only a short life.

Manufacturers are constantly endeavoring to improve their devices until now there is at least one make of draft gear having a travel of 3½ in., an increase of 1½ in. over the travel of the spring draft gear. This manufacturer realized that a long travel was not only desirable but very effective in destroying hard blows to which the cars are subjected.

The friction draft gear has solved many troubles and it remains to be decided which make is most desirable. The friction draft gear should have some means to compensate for slack which may occur due to wear of the parts of the device. This provision to compensate for slack should preferably be some form of adjustment which will accomplish this without reducing the length of travel, as reduction in travel means reduction of efficiency. The design of draft gear should be such that it will exclude small parts which may be easily broken or damaged. The design should not be complicated, thus making it easy for the average repair man to handle it when necessary.

The draft gear is fully as important to a car as the air brake and it would be to the railroads' advantage if they would maintain as systematic an inspection of draft gear as they do of air brakes. If air brakes were applied to the car and never looked after, how long do you suppose they would give good, efficient service? Other parts of the car are regularly inspected, so why not the draft gear, and thereby keep it working at maximum efficiency? A preferable design of draft gear would be one that is easy to inspect and maintain. Some designs of friction draft gear are so constructed that if anything is damaged or broken the gear is a complete loss, while in others the broken or damaged parts can be replaced and the draft gear put in working condition.

Railroads which have made a fair and impartial investigation of various draft gears have never failed to find the friction draft gear far more efficient than any form of spring draft gear ever made. Statistics of the cost of car maintenance show that cars equipped with good friction draft gears cost far less to maintain than cars equipped with spring draft gears. Some roads, in keeping the cost of maintenance covering repairs due to draft gear performance, do not go far enough, as the cost of repairs to the draft gear does not cover everything. The cost of replacing broken couplers, broken sills, yokes, yoke rivets and attachments should also be included; in fact, it is hard to tell just where to stop, as a good friction draft gear protects the whole car, while a poor draft gear causes more or less damage to the entire car, particularly in case of a box car, where it is not only destructive to the car but also to the lading. It also puts a car out of service while necessary repairs are being made, thus reducing the earning capacity of the car.

A number of roads which have had wooden cars equipped with spring draft gear that were a constant source of trouble, are at present stopping this trouble by removing the old obsolete draft gear and applying either steel underframes or cast metal draft arms to the cars and equipping them with good friction gear. The roads doing this have made a study of draft gear conditions and find that, while a spring gear is probably cheaper than the friction as to initial cost, it costs far more money in the long run in paying for repairs necessary because of poor protection.

While some of the roads have looked into the draft gear question, there are a number of them which have paid very little or no attention to it. They cannot realize what inadequate draft gear is costing them until they get right down and analyze the cost of repairs due to inferior draft gear and take into consideration the total cost necessary to put a car back into service after it has been hammered to pieces by not having the necessary protection. A number of roads have kept records of these costs and after doing it there has always been one result: they have quit using inadequate draft gear and have put on the best draft gear they could buy, with the result that instead of having cars on the repair track all the time and having congested tracks, they are keeping their cars in service, where they are earning revenue instead of helping to swell the expense account.

Another question. Why do not all railroads, when buying draft gear, make an investigation as to the merits of the different draft gears and have certain requirements covering draft gear? They will inspect various articles going into the manufacture of the car, but when it comes to the question of draft gear they generally do not pay very much attention to it. There are draft gear testing laboratories in this country where the railroads are at liberty to conduct any laboratory test they care to. These laboratories have been put up at great expense by the draft gear manufacturers, and there are at least two companies which are willing to offer their laboratories to any railroad at any time in order that they may conduct draft gear investigations. It seems, however, that some of the railroads do not realize the importance of a draft gear and what it means to them in dollars and cents. When the selection of a draft gear is left to the purchasing agent, as it sometimes is, he will generally buy the cheapest sort of draft gear, regardless of the fact that this same cheap draft gear is going to cost a whole lot of money for repairs later on. Again, the selection of draft gear is often made by some superior officer who is not acquainted with the different

devices, and who will often go against the recommendations of his mechanical men who have made a study of the subject.

The M. C. B. Association has made many and thorough investigations of various articles used in car building, but for some reason or other has done very little along the lines of draft gear investigation. I will grant that it has made some investigations and has gathered some valuable data, but it has merely scratched the surface and has not gone deep enough. Within the past two years it has conducted a long investigation into the manufacture and design of couplers with the idea of making a stronger coupler and thus reducing the enormous number of broken couplers occurring every day. At the M. C. B. convention held in Atlantic City in 1913, various types of couplers were on exhibition, illustrating ideas of strengthening them and eliminating some of the present troubles. The weight of the coupler was increased from 300 lb. to 500 lb. to overcome coupler troubles. Again we ask the question, why do not they also investigate the draft gear and see if something cannot be done there and thus help the coupler troubles by using an efficient cushion back of the coupler?

Railroads which have followed it up know that fewer couplers are broken when used in connection with friction draft gear than when used with spring draft gear. These facts are also more forcibly brought out when the records include steel cars, for, as above stated, a steel car has no "give" to it, to help out the poor draft gear, as is the case with a wooden car. The steel car is here to stay, so why not use all the draft gear protection possible and reduce draft gear and coupler troubles to a minimum.

THE SO-CALLED DRAFT GEAR PROBLEM

By Myron E. Wells Ann Arbor, Mich.

From an economic standpoint the draft gear problem is certainly most important. W. E. Symons, before the Western Railway Club, made a very reasonable estimate of the annual cost of repairs to freight cars that occur through the draft gear alone, and placed the figure at approximately ninety million dollars. This does not take into account the loss and damage claims, the cost of switching bad order cars to and from the repair track, the delays to traffic and the consequent overtime. It is also a most important factor in keeping the average daily mileage of freight cars down to the very low figure of twenty-five miles a day. This, to my mind, is a great source of lost efficiency, and one not usually taken into account.

The combined effect of all these handicaps results in greatly reducing the efficiency of the railroads. When all these matters are carefully considered and taken into account, the recent estimate quoted by the Railway Age Gazette of two hundred and fifty million dollars' damage per annum caused by draft gear troubles is not far wrong. At any rate, any efforts to solve the problem are certainly worth while, and I am very glad to add my mite, because I have for a good many years held some very positive ideas on the subject.

It is already well known that the modern type of friction draft gear is the best and most efficient so far produced. Understand, I am speaking of the type in general, and not any particular make. And with this improvement in friction draft gears we have advanced some, but the problem of reducing the expense of car repairs is still unsolved.

I want to ask, in this connection, why is there this distrust as to the work of our mechanical men along the lines of improved draft gears? No one is offering prizes for data to show that the locomotives and cars of the present day are an improvement over what we had ten and twenty years ago, because that fact is beyond question; so, also, is the fact of the present improved friction draft gears. Our railroad mechanical men are a valiant lot. They are usually equal to any emergency. They have made wonderful strides in improving locomotives and cars generally, but their work on improved draft gears is ques-

tioned and in grave doubt, so much so that it is now asked, What have they done? Is there any real improvement, and what is now the most efficient type of draft gear?

On the improvement of any particular mechanical problem the effort put forth, and the improvement made, is usually in proportion to the necessity for improvement; and of all the important necessities in modern railroading none has called louder or been more persistent than the one that has asked for an improved draft gear. My private opinion is that this has been well met by our mechanical men, and, considering the limitations under which they have been compelled to work, they have done nobly in producing the present friction draft gears, and their efforts are to be commended rather than questioned and criticized. If there is anyone who doubts the efficiency of the present friction draft gears I would ask him to not only read, but study carefully, first, the tests of a committee of the Master Car Builders' Association reported in 1908. Second, the actual road tests on the Southern Pacific Railroad, published in the Railway Age Gazette of January 8, 1909. Third, the facts and figures presented by J. C. Fritts on this subject at the September, 1913, meeting of the Central Railway Club.

If they will take the trouble to go over this evidence carefully, I do not understand how they can still continue to doubt. As for myself, I am thoroughly convinced, not only from the facts cited, but from personal experience, that modern friction draft gears do absorb shock; and the Master Car Builders' tests show that draft gears after from one to five years' actual service were equally efficient with the new in absorbing the shock.

Perhaps a large share of the distrust in friction draft gears comes from the fact that the method of absorbing the shock by friction is sort of paradoxical and hard to understand. It is also most clearly shown that these modern friction draft gears do away with practically all of the shocks from recoil, and if they did only this one thing they would still be enough better than the old spring gears to warrant their substitution. That, in a general way, they are stronger and more efficient is shown most clearly and emphatically by Mr. Fritts' figures. It must be remembered that our mechanical men, in dealing with the draft gear problem, have had to stay within the limitation of 21/2 in. or 3 in. travel, and have had to build the drawbars inside of the limitation of one square foot. With these limitations they have done as well as could reasonably be expected. If you could give them a 5 in. or 6 in. movement instead of 21/2 in. or 3 in., they could make the friction plates take up much more shock. Also if they had five or six square feet instead of one square foot, they could build a stronger drawbar. But this first is out of the question because you could not then keep the air hose coupled, and in the second case you would complain of the increased

Is there then a solution of this problem? Surely there is. But it is not to be found, in my opinion, along the lines of your suggested competition, nor in finding the most efficient type of draft gears. The solution of the problem is not mechanical. The remedy lies with the operating official in stopping the outrageous and unwarranted destruction of cars in our switching yards.

BETTER OPERATION NEEDED-NOT BETTER DRAFT GEARS

Mr. Fritts, of the Lackawanna, in classifying the damage done to draft rigging, places it in the following order: First, damage on the road because of the introduction of heavier power and larger trains; second, the switching of light and heavy cars together; third, and he says the most important, is the starting of trains and taking slack. Under this head he mentions as a suggestion that cars are sometimes damaged in switching yards. I do not like this classification, and I am going to put the switching of cars in yards as the one great cause of most of our drawbar trouble. Cars are damaged in yards 20 to 1 for those damaged on the road, and my proof for this is the difference in the trouble in maintaining the draft gears on yard and road locomotives.

In road work practically all of the work is done on the tender

drawbar. Any roundhouse foreman can tell how long an average tender draft gear will last in the average switching yard. The fact of the matter is that they do not last at all; and for this reason you will find all yard locomotives doing the work with the front end. Not only this, but you will find that the front ends of yard locomotives have been wonderfully strengthened beyond anything possible on an average tender or car. The extension frames have been shortened and made much heavier; in some cases a large cast steel filling piece is placed between the frames to add strength. Then it has been found that the ordinary front-end timber is entirely inadequate, and this has been replaced by a cast steel member, and even then the round-house foreman's troubles are not over in maintaining it.

The necessity for switching from the front end of yard locomotives is so great that in some cases the reverse lever has been changed to the left side of the locomotive in order that the engineer may be on the inside of the curve in some yards where a large amount of switching is done. And while there is all this trouble with yard switching engines the roadmen are going along day after day doing all the work with the drawbar on the tender, with very little drawbar trouble.

During a six months' period recently I rode thousands of miles on freight trains on a trunk line railroad; and in that time no train I was on pulled out a drawbar, and I received but one severe shock, and this did not damage the drawbars to make a delay. In a large majority of cases where drawbars are pulled out on the road the initial damage was done in some switching yard. In this connection I want to speak of the work done by the Air Brake Association and the Traveling Engineers' Association in reducing the shocks in road work. They are entitled to a great deal of credit for the work that has been done; and yet practically nothing has been done to decrease the shocks in switching yards. In fact I sometimes think that the stronger and more efficient the draft gears become, the harder the switchman persists in throwing the cars together.

Mr. Fritts in his report says that from 70 to 80 per cent. of the drawbar damage was due to shock, and he further adds: "If this monster shock is responsible for so great an expense to the railroads in general, and we all know that it is, what should be done to relieve the equipment of the ravages of this demon?" Do we all know that this "monster shock" is responsible? For myself I have known it for years, and I believe with Mr. Fritts that every railroad man in this country knows it also, and if this is true, and we have the courage of our convictions, why can not the problem be solved?

Operating officials have side-stepped it long enough by making themselves believe it was a mechanical problem. So far as I am concerned, the whole object of this paper is to answer Mr. Fritts' one question, and the answer is very simple. The solution of this so-called draft gear problem does not depend upon any particular type of draft gear. It is a matter of stopping the present methods of switching in our yards. A solution of a very large percentage of the trouble will be accomplished when operating officials cut the speed of switching operations in yards. I know on practically all the railroads in this country that the switchmen are supreme in the matter, but the officials must take a stand and stop the destruction.

To back this argument I want to cite that the Pennsylvania Railroad some five or six years ago issued an order limiting the speed of switch engines to two miles an hour, and it is well known that the Pennsylvania road is leading in this matter, and that it has some very rigid rules, and that it is actually stopping in a great measure rough switching in yards. In most yards five miles an hour is considered slow switching, and four cars cut off at one time is a reasonable average. These four cars, loaded, weighing approximately 600,000 lb., striking other cars at five miles an hour, develop over a million foot pounds of energy, and this shock is more than any draft gear can possibly be made to stand, friction or otherwise.

Locomotive boilers are built on a factor of safety of four. What would you think of the sanity of a man who would allow 800 lb. of steam put on a boiler that was made to carry 200 lb.? This seems a very silly question, yet you are allowing your draft gears on cars to be mistreated as badly as this every hour of the day and night. If there is a general manager who doubts my statement he can convince himself by spending a few days and nights in some switching tower watching the actual work. To get his full money's worth he must make sure his presence in the tower is not known to the switchmen.

I believe you will all agree with me that any time now gained in hurry-up switching is more than lost in the extra switching of the bad order cars produced by the hurry-up methods. But whether this is true or not makes little difference, because cars cannot be made to withstand the shocks they get, and I know of no solution but to cut out the shock.

All of this expense and destruction to the freight cars does not take into account the millions of damage claims paid annually on account of rough switching. The Santa Fe has a special committee working to reduce the damage claims, and it is spending much time on methods of loading and schemes of fastening freight in cars so that it cannot move, etc. This is all very good in a way, but if it really wants to accomplish much in a short time, I would suggest that it join forces with the mechanical officials, and go in a body to the operating officers and persuade them to issue some kind of an order that will stop the rough switching in yards. It will save them millions annually in both freight car repairs and in freight claims, even after they have put on a few more switch engines and crews.

Most railroads handle their passenger equipment in a reasonable manner, and I have maintained for a good many years that no general manager would go wrong if he ordered all freight cars switched in the same way that passenger cars are usually handled. If we are really convinced that this problem is no longer mechanical, and that the large amount of money spent annually for car repairs and freight claims can be reduced by stopping the outrageous switching methods in our yards, then will the so-called draft gear problem be solved.

A COMMISSION ON RAILROAD ETHICS

Frederic A. Delano, president of the Chicago, Indianapolis & Louisville, has issued a circular entitled "Some Suggestions for the Owners of Railway Securities and Railway Officials." The circular contains a reprint of an editorial on the railroad situation published in the Chicago *Tribune* of May 31, a letter to the editor of the *Tribune* commenting on it, which was published in the *Railway Age Gazette* of June 19, page 1516, and the following appeal to investors and officials:

"I have been inspired by the foregoing editorial in the Chicago *Tribune* to address you, first, to call your attention to the editorial and then to some comments upon it addressed to the editor of the *Tribune*, and, lastly, to ask your consideration and perhaps your co-operation in an effort to bring about a better condition of affairs.

"As pointed out in my letter to the *Tribune*, railway undertakings are on a totally different economic basis from other undertakings. A railway project, however ill conceived it may have been or however bad the judgment of the original promoters, must continue to be operated, and this obligation makes many a railway or branch line a liability to its owners rather than a valuable asset.

"There is a theory prevalent—unfortunately among men who ought to know better—that the so-called book value put upon a railway property by its owners in capitalizing it is the basis upon which rates for transportation have been established. As a student of the subject for 29 years, I consider that the valuation of railways has about as little to do with the rates as the value of property at State and Washington streets in Chicago has to do with the price of handkerchiefs. In my judgment, there has been great confusion in the public mind between the meaning of the words 'cost' and 'value.' Because a railroad or

any piece of property costs a given sum does not prove that it is worth it, and it must never be forgotten that the government does not guarantee a return upon the cost of a railway. Whether the estimates of the government experts and engineers shall prove the value of the railroads to be more or less than the book values now claimed by the corporations will in no way pledge the federal authorities to giving the railroads any certain return on that valuation; and, in fact, if we are honest with ourselves, we must admit that the only advantage which can possibly accrue to the public from an expenditure of some ten to fifteen millions of dollars in the preparation of the figures, will be that, presumably at least, it will settle for all time the mooted but somewhat academic question as to whether the railroads are over-capitalized or not. My own judgment on the matter is that some railroads are over-capitalized regardless of whether the capital is more or less than the actual cost, while other railroads are under-capitalized equally regardless of that fact. In other words, it is clear to my mind that the value of a piece of property is determined by the use to which it is put; and in the case of property permanently dedicated to a public use, it is determined solely and wholly by that use, so that unless there is some possibility or serious intent of allowing a railroad's real estate to revert to its original condition of lots and blocks, or farms, it is silly to talk of the value of it as bearing any relation to the value of adjacent property. It necessarily follows that the value of railroad property today lies wholly in the hands of the legislative authority of the state and federal governments or in the hands of those commissions to whom the legislatures have delegated authority and administrative powers. The value of railroad property can be increased by increasing earning capacity, and can be diminished even to extinction by decreasing it

"From the foregoing it is evident that private investment in railroad construction is and has been a hazardous one, and inasmuch as the government gives no guarantee to the investor in the unfortunate enterprises, it should not deprive the investor in the wisely located and well conducted enterprises of not only a fair return, but something more than an average return on the investment. The public can properly demand that railroads as a whole shall not be allowed to earn an exorbitant return on the cost of their original construction plus the improvements and betterments since made; but this being based upon averages, it necessarily means that some properties will earn only a small return on their cost, while others are entitled to earn a very considerable return.

"It is manifestly to the interest of investors in railway securities and of every honest railroad man-and surely a very large proportion of them are honest-that the public shall understand the true situation. On the one hand, the railroad investor has been entirely unorganized and unrepresented, while on the other, the railway official has been entirely misrepresented by a few notorious examples of men who have gone wrong. There is need of organization among the investors and there is also need of organization among railway officials. Small investors must organize so that at every stockholders' meeting they will be intelligently represented just as they are in an English stockholders meeting. The railroad officials must organize so that they may establish on some firm foundation such a system of practices, business ethics and methods as will prevent their being discredited by ignorant, reckless or unprincipled men who are bringing to discredit an honorable profession.

"In short, then, my statement is that, however it has come about, the investor in railway securities and the railway official are today being done a cruel injustice by the public; that this is because these two interests either have not been represented at all or been grossly misrepresented. What is the remedy? Is it not evident that the time has come for effective, constructive work? Far-seeing men, be they bankers, railway officials, publicists or whoever they be, must aid in the solution of this great problem. We must form a commission of our own which, by correcting evils justly complained of, will put railway management in a proper light before the public. We want a commission

which not only will not countenance the methods which have recently come to light in the New Haven investigation, but which will set such a standard of business morals and ethics as to make such methods impossible. Such a body should be more than simply critical; it should point out effective remedies for uneconomical methods, wasteful practices and the like. Government supervision is necessary, but after 26 years of experience with it, it is evident that the railway problem needs something more; it needs effective co-operation among men of sufficient experience and knowledge to set things right."

AMERICAN SOCIETY FOR TESTING MATERIALS

The American Society for Testing Materials held its seventeenth annual convention at Atlantic City, N. J., June 30 to July 3, with a registered membership in attendance of 473. In the four days devoted to the convention, nine technical sessions were held at which fifty-nine papers and reports were presented.

President Arthur N. Talbot of the University of Illinois delivered the annual address, taking for his subject the "Relation Between Research and the Activities of the Society." He reviewed the growth in research work that has taken place during the life of the society and outlined the various activities of the several agencies at work along those lines and urged that the society should co-operate with them in the undertakings that came before it. He was especially solicitous that it should work in harmony with the other technical societies so that the results should be properly co-ordinated. He asked that the members encourage the making of larger appropriations for national, state and semi-public laboratories and said that they might properly ask manufacturers and consumers to support liberally research work in all lines on engineering materials.

TEST FOR METALLIC PROTECTIVE COATINGS

In the proposed test metallic protective coatings are exposed to an atmosphere saturated with salt water. The articles to be tested are placed in any convenient chamber into which there is projected an atomized spray of water saturated with common salt in solution, care being taken to avoid placing the test specimens directly in the path of the jet. The spray is produced by a jet of compressed air lifting the water to the nozzle, whence it is projected as a cloud. This apparatus is the common atomizer used in the household. For testing bare metals it is better to use a plain saturated atmosphere, as the salt solution is apt to be too severe. Failure is indicated by the development of red

RELATION OF BRINNELL AND SCLEROSCOPE HARDNESS TESTS

A paper was presented to show the relationship of the Brinnell and the scleroscope readings for hardness and the factor connecting the two was placed at 6.67. That is to say, the readings of the scleroscope multiplied by 6.67 will give the Brinnell readings.

PROCEDURE GOVERNING THE ADOPTION OF STANDARDS

A paper by Prof. Marburg, entitled "A Review of the Procedure Governing the Adoption of Standards," cited the regulations applicable to the constitution of technical committees and the by-laws and regulations pertaining to the procedure governing the adoption of standards. The author expressed the opinion that it would be difficult to suggest wherein the former might be materially improved, but in connection with the latter he presented critical arguments as to:

- 1. The amendment of a committee report by vote at the annual meeting; and
- 2. The requirement of a letter ballot of the society for final approval of proposed standards.

Concerning (1) he discussed the present policy by which amendments may be made by a majority vote of those voting, and an alternative policy under which the meeting would not be empowered to amend a committee report, but would have the power only to refer the report to letter ballot of the society or back to the committee. He concluded that neither of these alternative courses is free from potential evils, and suggested for consideration a compromise policy by which the meeting would be empowered to amend a committee report only by a vote of substantial unanimity—say a nine-tenths vote of those voting—whereas a two-thirds vote would suffice to determine whether recommended standards shall be referred without change to letter ballot of the society, or back to the committee for further consideration.

As to the prescribed letter ballot of the society at large for the final adoption of standards, the author asked whether an experience of 14 years had not shown such a ballot to be almost meaningless, and whether it is not time that it should be abolished.

Discussion.-The discussion of this paper was extended. Attention was called in the first place to the low estimate in which many of the specifications of the society were held by the users of materials, on the ground that they were voted upon by men who had no knowledge or experience to guide them in their decisions and it was suggested that members should be requested not to vote upon subjects for which they had no qualifications. It was generally acknowledged that the ballot system as used did not give convincing results. Various suggestions were made to overcome the difficulty, one being the division of the society into groups and of confining the voting for any particular specification to the members of the group to which it was assigned. It was insisted that the specifications were always drawn by men of experience and that they deserved endorsement on that ground, but that there must be some means by which matters could be referred back to committees where the members were dissatisfied with the reports as presented.

STANDARD SPECIFICATIONS FOR STEEL

These specifications were passed and referred to letter ballot without discussion in every instance except one. In that case the American Electric Railway Association sent a representative to protest against the adoption of the specification for quenchedand-tempered carbon-steel axles, shafts and other forgings for locomotives and cars. Objection was made to the specification for elongation and reduction of area as applied to axles that are used for the driving axles of electric motor cars on the ground that this reduction in the requirements would not insure the care in the heat treatment of the material that was desired. The association asked that the title of the specification be made to read "Quenched-and-Tempered Carbon-Steel Axles, Shafts and Other Forgings for Locomotives and Trailer Axles for Cars." This would have left the driving axles for electric cars out of the specification. There was considerable discussion on the subject, in which the representative of the Electric Railway Association maintained his position and the advocates of the specifications attempted to show that they would give a better axle than that obtained under the present specifications with which the Electric Railway Association was content. When the matter was referred to vote, the answer was very positive to retain the specifications unchanged and to include the driving axles of electric cars in them.

STANDARD SPECIFICATIONS FOR WROUGHT IRON

This was a short report and related almost entirely to a slight change in the specifications for stay-bolt iron. This change simply allows, in the case of retests, a reduction of 2 per cent. in elongation and 3 per cent. in reduction of area from that previously specified. During the past year the committee has conducted experiments with a view to establishing a standard vibratory requirement for stay-bolt iron. Comparative series of tests made on the several types of machines in use finally demonstrated that it would be impossible, on account of their widely different construction, to formulate a standard method of testing that could be strictly adhered to on any two types of machines. As a result of this condition the committee is of the opinion that

until such a time as it can see sufficient merit in any particular machine to warrant the adoption of a vibratory requirement based on that or a similar type of machine, the reinsertion of a vibratory requirement in the "Standard Specifications for Staybolt Iron" will have to be held in abeyance.

OTHER BUSINESS

The report on "Methods of Sampling and Analysis of Coals" treated in an extensive and thorough manner the methods of sampling and the chemical processes to be followed in the determinations of the various elements in the coal.

At the annual election the following officers were elected for the ensuing year: President, A. W. Gibbs; vice-president, A. A. Stevenson; secretary-treasurer, Edgar Marburg; members of the executive committee, Robert Job, F. W. Kelley, A. Marston, S. S. Vorhees.

EUROPEAN FREIGHT CONGESTION AND AMERICAN TRAIN DESPATCHING

By ARTHUR HALE

General Agent, American Railway Association

"Lingering Congestion." Is not that an eloquent term? Does it not remind you of that time in the winter of 1903 when the congestion which began on the Jinntown division lingered on into the lap (only the first lap) of spring? But J. Hansen, state councillor and member of board of works at Frankfort-on-the-Main, who invented the term and "proposes it" in the International Railway Congress Bulletin. does not apply the term to congestions that linger toward a conclusion, but to congestions that are lingering in their beginning.

When there is a landslide or derailment in Germany it seems, naturally enough, that the "main traffic office" of the railway is notified promptly and "special measures . . . are necessary to restore order." When, however, some slight delay to one freight train involves another, and perhaps still others, it seems that a German railway may "linger" into a congestion without anyone knowing it except the "assistant station master" and presumably the train crews and the shipping public.

Mr. Hansen takes more than three pages of the bulletin with the help of "sidings A, B, C," etc., and "goods trains 1, 2, 3, etc.," to prove without a possible shadow of doubt that "for some exceptional reason, for instance . . . because an unusual amount of time is required for the opera-tions on the loading sidings . . . " freight trains can, may and do delay each other. Small delays, he says, are unimportant, but there is a "danger point," and that danger point comes at "the moment in which the second goods train begins to wait" after schedule time "in order to be overtaken." "It is important to understand clearly," he says, "that this condition of beginning congestion, harmless though it may appear, is exceedingly dangerous to the regular operation of the science, as it forms a starting point for further development." And he goes ahead for several more pages in an exceedingly logical discussion of proper methods of avoiding this "danger point," for, as he truly states, "congestions of this kind cannot occur if the 'danger points' are eliminated."

Perhaps some young American may here inquire, "Why doesn't the train despatcher make a new passing point?" To him I reply, "My dear young friend, don't you know that in Germany, and in other countries for that matter, there are no train despatchers? How can the train despatcher make a new passing point if there is no train despatcher?" And further I could explain that there are no train sheets, no train reports, no train wire—nothing but a block-wire. And I could conclude that I have been informed that on foreign roads no such expensive system is necessary, their move-

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ments being so regular that all trains can be run as per schedule.

Even when there is a landslide or derailment and the "main traffic office" is notified it seems that the "special measures" taken are apt to be "changes in the time-table." Great—isn't it?

American railway men are curious as to how their European friends, operating as they do without train despatchers, manage to get on with their traffic in case of accident. Mr. Hansen's article dealing with this subject would seem to indicate that according to our standards, in time of accident, the European railways' freight service at least does not get on at all.

American railway men are also curious as to the European arrangement under which they are told the transportation department is made a part of the traffic department, and not allied with the two engineering departments. If we may judge by Mr. Hansen's article this is simply arranged by absolutely eliminating any form of organization such as we could term a transportation department.

But to return to "lingering congestions." They do not occur on single track lines. As Mr. Hansen states, "congestion produced by the blockade of the section is . . . a trouble to which single track railways are very much exposed." In other words, congestions on single track are apt to result in complete blockade.

It seems that no special instructions exist to deal with "lingering congestions." The whole matter is in the hands of the "assistant station masters," who appear to have absolute power over the movements of the train crews in adjoining blocks. The assistant station master is at liberty to allow a delayed freight train to come ahead, but if he has one already at his station he must run the risk of putting the second train on an unusual siding or on the opposite running track. In practice "he does not do this because it would give him a lot of trouble, besides he would run the risk of having to delay a passenger train." He will, as a rule, refuse to allow trains to enter his block unless he is absolutely sure he has sidings where he can readily place them in any event.

The result of this decentralization of authority is that as many as three or four goods trains may be "put in wrong places and all the assistant station masters concerned . . . in a 'state of great uncertainty.'" It is difficult for the assistant station masters involved "to come to a mutual understanding as . . . there are no special rules specifying which train is to have precedence. It gradually becomes more and more difficult to get trains through. . . Locomotives and crews perhaps arrive at their destination so late that the time at which their return trains start has already expired and consequently the return trains are also late. The result is an ever growing confusion . . . the crew of individual trains which are standing still must leave their train or else the hours of work become too long . . . the final result is such a state of chaos that one is quite powerless to cope with the circumstances particularly as it is impossible to obtain a general survey of the state of affairs."

Mr. Hansen admits that "in most cases . . . there are . . . intervals in which individual trains can be pushed forward . . . this . . . depends . . . on the zeal and ability of the different assistant station masters."

Apparently, as above, a lingering congestion of this kind may go on for some time without anyone in authority knowing about it. Mr. Hansen states "a lingering congestion is particularly dangerous . . . because its pressure and its dangers are not recognized in good time. It is true that one notices that trains are late . . . but the ordinary assumption is that this is due to increased traffic for which existing installations no longer suffice. Either no attention is paid to the matter or auxiliary trains are run in order to deal more quickly with the traffic." In other words, when there

are too many trains on the road the ordinary method to deal with the situation is to start more trains running.

He goes on, "It is quite possible for a number of goods trains to be standing still and for several stations to be over-crowded before the authorities become aware of the fact. It is only when it becomes nearly impossible for goods trains to be sent on that it is recognized that it is a case of congestion. . ."

When a congestion is recognized, it appears that the traffic manager does take a hand, and Mr. Hansen evidently has had experience in clearing blockades. For instance, he offers this undeniable fact, ". . . it seems advisable to begin with clearing those passing-places where, according to the timetable, trains have to overtake each other." But it is only when there is a very bad congestion that anything like train despatching is resorted to, and then under extreme difficulties. Mr. Hansen says, "If a congestion has already assumed larger dimensions before the traffic manager is informed . . becomes exceedingly difficult to cure it and sometimes takes much time, as it is impossible to ascertain with certainty the probable results of any measures proposed." In this case it seems advisable that the traffic manager should in the first place obtain a general survey of the train movements and ascertain which trains are held up at the different stations. For this purpose it is advisable to issue orders that within the whole of the district affected certain definite stations should report by telegraph to the traffic manager the actual time of arrival and time of departure of each goods train. . In other words, a train despatcher system has to be improvized to clear the blockade. To use Mr. Hansen's words, "With the help of this information the traffic manager would enter (record) the real movements of the trains . . . and could proceed to work out the prospective future movements just as one can work out the movements of the figures on a chessboard. With the help of the information acquired in this way, it would then be possible to give the stations any orders necessary." Mr. Hansen admits that "in exceptional cases this procedure could be adopted beforehand," but in general he appears to distrust the train despatcher system, because "the adoption of this system would involve an entire revolution of all our traffic arrangements, and as there is the fear that great difficulties would arise, seeing the density of our traffic, the author thinks that this would be inadvisable."

It can hardly be thought our foreign friends are fully advised as to the adaptation of the train despatcher system to our double track and four track roads of heavy traffic density, or Mr. Hansen would hardly propose the half-way plan which follows as a cure to the "lingering congestion" which he so clearly analyzes and of which he so bitterly complains. After showing that no "lingering congestion" could occur if all "danger points" were avoided and after showing that many danger points could be avoided if assistant station masters were given more discretion, especially in the way of delaying passenger trains somewhat and of taking certain liberties with freight trains, he comes to the conclusion that as assistant station masters will err, the traffic department should be in position to supervise them, both day and night.

As he puts it, "It is necessary for the traffic management to exercise a continual supervision over the assistant station masters." With this object in view, the following rules are proposed:

"1. The traffic management must always—day and night—be ready for work.

"2. Any lateness of goods trains, greater than a certain amount (yet to be fixed), is at once to be reported by wire.

"3. Any special incidents affecting the traffic, such as accumulations of wagons, . . . are at once to be reported by wire."

The management will take no action on these reports unless.

it considers that a "danger point" is imminent. In such a case the traffic management will take the matter up with the assistant station master, "will ask him what he intends to do, will authorize him to do what is advisable or will give him instructions." It is confessed that "a certain time will always elapse after the disturbance of the service has begun before the traffic manager will be in position to intervene." But the author does not consider this a serious objection, "as a lingering congestion only develops slowly."

One material concession is made: ". . . In principle it might seem better if the traffic manager were able to intervene at once." This, however, involves a wholesale adoption of the train despatcher system, and as above stated, "there is the fear that great difficulties would arise, seeing the density of our traffic." Is it possible that the author has compared the density of his traffic with that, say, of the main line of the Pennsylvania Railroad?

Mr. Hansen's article is answered in the same issue of the bulletin by a gentleman who signs "H. T.," who thinks the proposition too radical and that it is very doubtful whether it would succeed. "H. T." continues: "If the traffic management is to control the movement of the trains not from the spot, but from a distant office, on the receipt of telegraphic news, it must not be left out of consideration that the state of affairs may in the meantime have become so much changed by other circumstances which have arisen (e. g., shortness of engines, etc.) that the orders of the traffic management can no longer be carried out." It seems quite clear that "H. T." knows much less about train despatching than Mr. Hansen. H. T.'s idea seems to be in favor of giving the assistant train masters more discretion, although he agrees that "if the traffic congestion extends over a large district . . . then it is, of course, necessary for the head office to intervene," and ends with the hope "that this work will be carried out successfully by the recently established train management

Mr. Hansen does not refer to these recently established offices. Possibly they are the beginning of a train despatching system which will doubtless have to work its way gradually before it is adopted. Indeed, it seems probable that the American system never will and never should be adopted in all its detail on the other side.

Our train despatcher system was worked out before our signal system, while the signals have come first on the other side, and it would not be surprising if they found that the train despatcher's orders should not be sent direct to "conductor and engineer," but to the tower man, or some functionary at the station like the German "assistant station master" who could transmit them to the engine driver and crew, probably by signal.

There is much that is instructive in Mr. Hansen's article in regard to car supply and its relation to congestion, and there is another point which should not be lost sight of.

If it is true that congestion on continental railways is ordinarily attributed to lack of facilities without investigation as to whether the transportation management is good or not, it is impossible to escape from the conclusion that many facilities have been provided which would not be necessary with improved transportation methods. Possibly this throws some light upon the enormous capitalization of the European railroads.

EQUIPMENT ORDERS OF THE SOUTH AFRICAN RAILWAYS.—The South African Railways in 1913 placed orders in England and other countries for passenger cars having a total value of \$1,400,345; for freight cars having a value of \$4,940,000 and for locomtives having a total value of \$6,660,000. Very often large orders are placed abroad simply because of the quick deliveries which can be obtained. The English and other shops can deliver the equipment in from 9 to 12 months, whereas the local shops require from 18 to 20 months.

THE FEDERAL EMPLOYERS' LIABILITY ACT*

By J. B. SHEEAN

General Solicitor, Chicago, St. Paul, Minneapolis & Omaha Railway.

The federal employers' liability act has effected a revolution in the law as it existed prior to 1908, and is for you the supreme law of the land. It is as remarkable for the laws it abolishes as for the law it prescribes. It is of vital concern to you and must be considered whenever an employee's claim is presented. It is developing from day to day as its various provisions are construed by the courts, and you will find its study as full of interest to yourselves as of benefit to the interests that you represent.

Expressed generally, this act regulates those relations of common carriers by railroad and their employees which have a substantial and direct connection with interstate commerce and while both carrier and employee are engaged in such commerce. It creates a new cause of action and establishes a uniform rule of liability. It introduces a new public policy applicable to railroads and their employees and radically changes the existing law. It supersedes the laws of the several states, in so far as the latter cover the same field, and is supreme within its sphere of action. It must be construed by itself and cannot be pieced out by state legislation. If no liability arises under the act, none can arise from state legislation on the same subject. It probably conflicts with one or more laws of every state and supersedes all such laws. It establishes a liability for the acts of all servants, whether they be engaged in work involving special railroad hazards or in state or interstate commerce. It abolishes the defense of contributory negligence. When a federal law enacted for the safety of employees is involved, contributory negligence can be considered for no purpose. Where no such law is involved, contributory negligence may be considered for the purpose of apportioning the damages. When such a law is involved, the act also abolishes the defense of assumption of risk. In all other cases this defense may exist and must be ascertained and applied in accordance with the decisions of the federal courts. The act also removes the death limit, prescribes to whom the proceeds shall go in case of death, requires a jury to assess the pecuniary loss of each beneficiary, limits the commencement of actions to two years, and requires no preliminary notice to the carrier before suit is commenced. Under this act no one can bring suit except the legal representative of the deceased, and only one action can be maintained. Damages are limited to the pecuniary loss sustained by the beneficiary; that is, the pecuniary assistance which the beneficiary had reasonable expectation of receiving from the continued life of the deceased. Except in the case of a minor child, no damages are recoverable for loss of society or companionship; none are recoverable for the grief or wounded feelings of the beneficiaries, and probably none for the expenses incurred or suffering endured by the deceased before death.

The act removes all of the foregoing questions from the control of the states and is exclusive and supreme within its sphere of action.

The question presented for consideration today is, "What is this sphere of action or when are railroad employees engaged in interstate commerce?"

The act provides that every common carrier by railroad, while engaged in commerce between any of the states, shall be liable in damages to any person suffering injury while he is engaged by such carrier in such commerce, if such injury be caused by the negligence of any of its officers, agents or employees, or by reason of any defect, due to its negligence, in its cars, engines, appliances, machinery, track, roadbed, works, boats, wharves or other equipment. The injury, therefore, must occur while the carrier is engaged and the employee is employed by the carrier in interstate commerce, and the test always is whether the work

^{*}Address presented at the annual convention of the Association of Railway Claim Agents, at St. Paul, Minn., on May 21, 1914.

in question was a part of the interstate commerce in which the carrier was in fact engaged.

Commerce between the states begins when a shipment is delivered to a carrier for transportation to another state and ends with its delivery at destination. It embraces all acts necessarily incident to the receipt and delivery of such a shipment. Cars containing one or more shipments or containing mail, express matter or passengers moving into or out of one state or across or in and out of the same state are engaged in interstate commerce. Trains or cars containing shipments, mail, express or passengers so moving are likewise so engaged, although they only move between points within a state. Empty cars moving across state lines are also engaged in such commerce. Inasmuch as commerce is done by the labor of men and with the help of things, these men and these things are the agents and instruments of such commerce. The act, therefore, applies to every agent and instrumentality by which interstate commerce is carried on and extends to all moving matters having a real or substantial relation to such commerce. An employee engaged in repairing instrumentalities used in interstate commerce, or in moving such commerce, is engaged therein, and if an employee acting within the scope of his employment is engaged in such commerce, it follows that the carrier for whom he works is so engaged.

Whether an employee is so engaged must depend in each case upon the special facts of that case. Courts have had no difficulty in agreeing upon the definitions and general principles involved. They have differed widely, however, in applying these definitions and principles to the cases presented. Since the last meeting of this association, the Supreme Court of the United States has rendered a number of decisions directly bearing on the question under consideration. It is now possible to name with assurance many of the employees to whom the act applies.

In the light of these decisions, it may be stated that the following employees are within the act:

(1) All employees working on or about or assisting in the movement of trains which cross state lines or contain cars loaded, in whole or in part, with mail, freight, express or passengers moving into or out of one state or across or in and out of the same state are admittedly within the act.

(2) All employees engaged in making up, breaking up or performing any necessary work in connection with such trains, or cars at terminals, are within the act. In the Seale case the court held that a yard clerk killed while on his way through the yards to take the numbers, check the seals and tag certain interstate cars was performing work directly connected with interstate commerce and that the interstate transportation was not ended merely because the train had arrived at a terminal and the cars therein were not going to another station. Irrespective of their final destination, it was necessary that the cars be switched for the making up of outgoing trains or for the unloading of freight, and this was as much a part of interstate commerce as was their movement across the state line. You will note that this man was not actually at work when injured, but was on his way through the yards to his place of work and was within the act. From the rule so announced it follows that enginemen, trainmen, vardmen, repairmen and inspectors engaged in making up, breaking up or performing any necessary work in connection with interstate cars are within the act.

(3) All employees while at work in preparing engines or cars for use in interstate commerce are within the act. In the Zachary case the court held that the acts of a fireman in oiling, firing, inspecting and preparing his engine soon to start on a trip within the state, done before two interstate cars ordered to be attached to his train had been so attached, and before his engine had been coupled on to his train, were acts performed as a part of interstate commerce. When killed, the fireman was on his way, within the yards, to his boarding house for a brief visit and was held to be within the terms of the act. Applying the rule thus announced, it follows that all enginemen, engine wipers, hostlers and inspectors engaged in preparing engines and trainmen, yard-

men and inspectors engaged in preparing cars for immediate service in interstate commerce are within the act.

(4) All employees engaged in the work of maintaining and repairing instrumentalities in proper condition after they have become and during their use in interstate commerce are engaged in that commerce, although such instrumentalities are used indiscriminately in both state and interstate commerce.

In the Pederson case the Supreme Court held that it would not undertake to separate such service into its elements, and that an ironworker injured while carrying bolts from a tool car to a bridge, to be used in the repair thereof, which bridge was being used indiscriminately in both state and interstate commerce, was within the act; that it was necessary to the repair of the bridge that the materials be at hand and the act of taking them there was a part of that work. Excepting for the phrase "during their use in interstate commerce," the principle announced in this decision would clearly apply to the repair and maintenance of all instrumentalities used indiscriminately in state and interstate commerce. Text-book writers and other courts, however, construe this decision as applying generally to all instrumentalities so used, whether actually in use or temporarily withdrawn from use for the purpose of repair.

It has accordingly been held that all employees engaged in repairing or maintaining tracks, switches, bridges or roadbeds used in both kinds of commerce are within the act, and it follows that all employees engaged in repairing or maintaining cars, engines, appliances, machinery, works, boats, wharves or other equipment used in interstate commerce, or used indiscriminately in state and interstate commerce, are within the act. It should be noted that employees engaged in the original construction of such instrumentalities are not within the principle announced and probably not within the terms of the act. Such, at least, is the reasonable construction to be placed upon the language of the

Applying the principles announced by the Supreme Court in the foregoing cases, the district courts have held the following employees to be within the act:

A truckman injured by a truck while loading interstate freight into a car.

A trainman injured while weighing an empty car last used in interstate commerce for the purpose of ascertaining the net weight.

A brakeman injured while making a flying switch to set out a car loaded with state traffic, although taken from a train carrying both state and interstate traffic.

It has also been held that an employee injured while at work in the construction of a new tunnel intended for use in state and interstate commerce was not within the act and that non-resident alien beneficiaries are not entitled to the benefits of the act.

It will thus be noted that the greater part of the work performed by railroad employees is connected with the instrumentalities or movements of interstate commerce. This is due to the fact that the liability act embraces the repair of all instrumentalities used indiscriminately in both kinds of commerce and all movements connected wholly or in part with interstate commerce. If any shipment or passenger in a car or train is moving interstate, the entire car or train is engaged in that commerce, even though the car or train may only move between points within a state. The general opinion has prevailed that this act would be construed to apply to every employee over whom the power of Congress could be exercised. Within the past 30 days, however, the Supreme Court has decided to the contrary and, in the case of I. C. Ry. v. Behrens, has made it clear that Congress intended to limit the act to injuries occurring when the particular service in which the employee was engaged was a part of interstate

In that case, a switching crew was engaged in yard work, moving state and interstate cars indiscriminately, frequently both at once, and at times turning directly from one to the other. At the time of the injury the crew was moving several cars loaded

only with intrastate freight and after completing that movement intended to switch certain interstate cars. It was held that the particular service in which the crew was engaged at the time of accident was no part of interstate commerce and that the fireman was not within protection of the act. The principle therein announced is an important one and the case should receive your careful consideration. It puts at rest the contention that the act applies to all employees and substantially increases the number of employees not within the act; it emphasizes the necessity of analyzing every car or train movement, and gives assurance that the act will not be unduly extended beyond its terms.

From the foregoing considerations it follows that the act does not embrace instrumentalities used exclusively in state commerce and does not apply to employees engaged in moving trains or cars which are disconnected from interstate commerce. The act does not apply to employees exclusively engaged in moving state cars, although the employees may be engaged in the indiscriminate movement of both state and interstate cars. The act, however, does apply to employees injured when repairing or maintaining instrumentalities used indiscriminately in state and interstate commerce. It does not apply to employees while at work in the original construction of such instrumentalities and should not apply to general office employees whose work is not directly or substantially connected with interstate commerce or its instrumentalities.

Within the limits of this presentation I have given you the controlling definitions and tests for determining what employees are within the act and have named the employees certainly included within and those certainly excluded from its operations. Between these limits are employees whose status is uncertain and in such cases the question may be one of fact to which no answer can be given until after the verdict. The act, no doubt, will continue to be liberally construed and in case of doubt or disputed facts you will be wise in assuming that the act applies.

MAIL-PAY RATES

Congress appears at present to be doing nothing at all to correct the continuing injustice of the present arrangements for paying the railroads for carrying the mails; but as the Bourne committee has not presented its report and as the Moon bill is the only important proposition on the calendar, nothing better than inaction could, perhaps, be hoped for. In the meantime Mr. Peters, speaking for the railroads' committee, has written to Mr. Moon a letter, again calling attention to the inconsistencies of the present arrangement.

In this letter he says:

"The Committee on Railway Mail Pay appeals for fair treatment in fixing any basis of compensation for the handling of the mails.

"A personal effort was made by members of this committee to secure from you a hearing on the bill recently introduced in Congress by your committee, but without success; therefore we submit this open letter.

"We desire to protest against the method of paying the railroads for the valuable service rendered the Government as contemplated in House Bill No. 17042. This question is now pending before a Joint Congressional Committee, which has had the whole subject under most careful consideration, continuously, for more than two years, and has announced that it is about ready to make its report.

"The introduction of bill No. 17042, in effect, forestalls the report of this Joint Committee, and commits Congress before the results of that investigation are made known.

"The Joint Committee of Congress is a bi-partisan body, and the Post Office Department has had the fullest opportunity of presenting the views of its officials before it, many of them having appeared as witnesses. The railroad companies have been called upon at great expense to furnish complete detailed information. . . . The passage of House Bill No. 17042 would practically ignore the action of your own Joint Committee.

"This is the fourth bill which the Post Office Department has framed and recommended on this subject within the past two years, each differing materially from the others. . . .

"The railroad companies do not favor the adoption of any space basis for ascertaining what is proper compensation for carrying the mails. The mails are freight and they are becoming more and more so as the weight of the parcel post increases and the Government enters more and more into competition with the railroads of the country in the business of carrying commercial freight.

"Space in cars under complete control of officials of the Post Office Department as a basis of payment for this service is an anomaly; it will not fit your mail service; and, in our opinion, it will tend to the reduction of facilities and general inefficiency. In this service the Government is a shipper, and no other shipper demands the right to fix his own rates. It uses the facilities of the companies in competing with their own service, and in view of the published intimations of greatly added revenue from the carriage of parcel post, common fairness would seem to demand that the railroad companies should be permitted to share in the increased revenues that the Government collects from the people for the use of these facilities.

"The wiser policy, it seems to us, will consist in modifications and improvements of the existing system, based, as that system is, upon the method of compensating railroads for carrying freight that is universally recognized as sound; such modifications to be an annual weighing of the mails, payment for the use and haulage of apartment post office cars, relief from the messenger service, and other reforms. . . . Congress should at least hear the complete testimony, giving the reasons for the position taken by the railroads, as well as the conclusions of your Joint Committee. . . ."

Mr. Peters has issued a circular containing editorials from thirty newspapers, published in many States, and most of them prominent papers, condemning the unfair attitude of the Post Office Department.

The presidents of the prominent roads west of Chicago on June 30 sent to Mr. Moon a protest similar in tone to that of the Mail-Pay Committee, and requesting that no action be taken by Congress or by its committees until the Bourne report shall have been received.

Ex-Senator Bourne is speaking his mind quite freely concerning the postal service. "In its persistent efforts to secure dictatorial power, the Post Office Department," says Mr. Bourne, "has broken all records. The department bill, H. R. 17042, provides that 'not exceeding' certain rates shall be paid to steam railroads for transportation of the mail. The same bill also contains a clause compelling the railroads to carry mail.

"It is claimed that 'not exceeding' is but a continuance of existing law; but heretofore the railroads have not been compelled by law to carry mail. They are supposed to have accepted the rates as a voluntary act, which in itself was assumed to be sufficient guarantee that rates would not be too low; and it was thought necessary only for Congress to fix maximum rates. But this assumption was not sound, as a railroad would hardly dare to refuse to carry mail; such action would considerably irritate the community along the road.

"The Interstate Commerce Commission is now authorized to fix maximum freight rates, it being left to the railroads to fix the minimum. It would be considered preposterous for the commission to fix the maximum rates at which railroads must carry freight and leave the shippers to fix the minimum. Yet this is the very thing that the Post Office Department in the Departmental bill, proposes for mail pay. Congress is to fix the maximum rates and the shipper—the Post Office Department—is to fix the minimum rates, and the railroads are to be compelled to carry the mail. This is a proposition without parallel in the history of rate regulation. It is bureaucracy run mad."

The General Office Clerk—A Neglected Factor

Bureaus Suggested to Specialize in Appliances and Methods and in Selection of Men for this Department

BY GEORGE A. CLARK

The army of general office clerks represents to a greater or less degree in every railroad organization, certain neglected opportunities for direct economy of expenditure and opportunities for more efficient service to the entire organization. The relative and absolute importance of the work of this group of railroad employees has increased tremendously during recent years. The latest figures covering expenditures for this purpose are those published in the statistical report of the Interstate Commerce Commission for 1911. In that year the railroads of the United States reporting to the commission paid out in the form of compensation to "General Office Clerks" a total of \$61,971,046. This amount represents an increase of 149 per cent. over the amount similarly expended ten years before. As contrasted with this, the amount expended as compensation for "general officers" and "other officers" increased during the same period but 48 per cent. It appears that in 1901 the pay of clerks exceeded that of officers but 11.9 per cent., while in 1911 the difference amounted to 88 per cent.

In so far as these comparisons indicate tehdencies in railroad development, two striking factors appear—the contention of the editors of the Railway Age Gazette that one of the crying needs of present day railroad organizations is more men to act as supervisors, the other that in the total of the amount paid to clerks when considered with the increase during the past decade, a condition exists which should challenge the attention of railroad officials alert to every opportunity to make each factor in their department and organization fully productive. The amount expended as compensation for clerks represents an important and rapidly growing expenditure which under the most favorable conditions can only be made productive in part. It is one of the many factors which have brought the railroads of the country to their present position.

Although the general office clerks have become an increasing burden in railroad organizations, few of the men so employed are in a position much better than that of ten years ago. Most of this work is of such a character that effective organization for purposes of bettering conditions of work and pay is not practical. In many instances men in this kind of work are contending with difficulties from which other classes of employees escaped twenty years ago. The increase of 149 per cent. in the compensation of "general office clerks" is largely one of bulk—additional clerks taken on to perform additional clerical labor.

For the purpose of this discussion the work of this class of employees may be grouped into two principal classes, the first that of preparing and keeping the records necessary properly to carry on the work of the company, the second, the rendering of personal service for the purpose of facilitating the work of individual officers. The first item is of principal importance, although it is essential that some attention be given to the second factor, as it is a time and expense consumer in every railroad organization.

A railroad organization must maintain records for one or more of three purposes: These are (1) to preserve the essential information having to do with the corporate and fiscal affairs of the company; (2) to meet the requirements of federal and state laws and regulating bodies; (3) to facilitate the work of administrative and executive officers in better performing their duties with respect to the operation of the property.

Without doubt there has been in the past ten years a very marked development with respect to the detail in which each class of the above kinds of records are kept. The requirements of each have in many instances interworked in making it necessary to keep more elaborate and detailed accounts of every phase of railroad operations.

Complexity in intercorporate relationships is one of the most striking features in the organization of an American railway system. A property that presents a rather simple operating organization may be maintained as to its legal and financial existence through records of from fifty to one hundred corporations. During the past ten years there has been a growing respect for the value of accurate legal and fiscal records. It is a development that is on the whole highly desirable, as it insures to both the stockholder and the public, data which may be essential in determining the relative rights of each.

The largest single factor, however, which has contributed to the increase in the expense of the railroads through compensation of general office clerks arises from the constantly growing demands of various public bodies for reports of one kind and another bearing upon the operations of the railroad property. A railroad system operating through a number of states, many of which require different kinds of records and reports, places upon every railroad organization the burden of a heavy, and at times oppressive, amount of clerical labor. It is possible that there will be more sense and less insatiate desire for volume in future demands along this line. In the past too many reports required by governmental bodies have had for their principal purpose the employment of additional clerical labor, the vexation of railroad auditors and the increased frequency of pay day for public printers.

Although it is reasonable to expect that there will not be so much required by public bodies in the future, it is probable that the development and use of statistical records by administrative and executive officers is as yet in its infancy. In certain organizations, and with certain types of executives, this represents already an important item in the work of general office clerks. It is quite probable, however, that the volume of the right kind of data could be very materially increased for the right executive. It is also probable that an increased appreciation and demand for this type of records will be one of the interesting developments in railroad organizations during the next few years. This is the one kind of general office work which, if material be properly compiled and intelligently used, can be considered almost as productive as the moving of a car of coal over the property.

This situation obtains generally; a very considerable volume of records is essential in maintaining the fiscal, legal and operating efficiency of American railroad organizations. Whatever development there will be in the future will be in the direction of a greater volume than now exists. Records will be kept and considered of value for reasons to which we give little attention at this time. The problem involving any consideration of the relation of the expenditure for this class of labor to other railroad expenses is to get back into the processes by which the records are compiled.

Before taking up this point, however, it is important to consider one additional service which consumes the time of a considerable number of employees classed as general officer clerks. I refer to the various types of personal service which secretaries, confidential clerks, etc., are called upon to render, types of service which are generally considered as proper in that they serve to materially increase the efficiency and effectiveness of the work of their superiors.

In this type of service there is a very considerable amount of waste—time which is taken by the interested officers for needs semi-personal and semi-official. There is no means by which this expenditure can be regulated other than the conscience and common sense of the officer interested. With advancement and opportunities many men have an unconscious tendency to

shift their point of view with reference to fine distinctions as to "mine and thine" in matters of company time. If the wife of the boss wants a box of peaches for dinner it is not an uncommon thing for the office boy to be despatched both to purchase the peaches and deliver them. If, on the other hand, the private bank account is at an inconvenient location it is not uncommon for the secretary to make regular trips for cash. Such items in themselves are of small consequence and considered without reference to the rest of an organization not worthy of notice, but when magnified by the imagination of a none too ambitious office force, they become consciously and unconsciously the justification for a variety of petty delinquencies on the part of the rank and file. The idea that "the king can do no wrong" is more diligently fostered in a railroad organization than in many lines of business and commercial life. There are, of course, requirements in discipline that demand the implicit obedience of employees, but in general office work, at least, there are many situations where one of the best experiences that could happen to the head of an office would be to take a certified copy of the honest opinion of those nearest to him among his subordinates.

Wastes of the character just described, although worthy of mention in this connection, are not of first consequence, however. Of far greater importance is a consideration of the various factors which enter actively into the great part of the time for which the railroad companies of the country expend more than \$60,000,000 per annum. In an analysis of the wastes that appear most conspicuously it is most convenient to group them about two principal propositions, the first, that a great deal of office work is poorly organized and more inadequately supervised, the second, that the railroads of the country have done little or nothing toward selecting the best qualified men for this class of work, and having once taken them into the organization have considered each employee as a potential executive.

A peculiar situation exists with reference to the physical conditions which surround much of the general office work of the railroads of the country. In many instances methods have been reduced to a thoroughly scientific basis and from the point of view of appliances, efficiency, organization and adequate supervision, the organization is all that could be desired. More frequently, however, it will be noted that the improvement in physical appliances has come about primarily at the behest of commercial organizations interested in pushing particular machines. Frequently a situation will be found in a department where a certain section of the organization works smoothly and efficiently and where adequate supervision can be found. Speaking generally, there are these three phases of the work constituting the elements of weakness of general office work.

The difficulty in adequately utilizing resources which are available in mechanical appliances arises from a lack of knowledge as to methods employed elsewhere, and from inertia. It frequently happens that machines are purchased after a desultory examination by officials who in many cases have not used and never expect to use, the machine themselves. Often to add to the difficulty, there has been no general test. Each department head, frequently each stenographer, is a law unto himself as to standards.

To overcome this difficulty it would seem that it would be profitable for every large railroad organization to create a bureau which specializes in standards and methods. Such a bureau would insure that every change or improvement which was considered, with reference to a given appliance, would be adequately tested. In short, such a bureau could insure that the proposed improvement would realize the results which should be expected. Of even greater importance, however, than the proper selection of the appliances used in general office work is the effectiveness of the plan of organization. A great deal of general office work involves the handling of a vast volume of routine material. In many offices there is a tremendous amount of waste due to improper routing and arrangement.

Here again it would appear that in the reorganization of a department, the experience of other individuals in a similar kind of work would be of the utmost value. In order to secure this,

a corporation should maintain a library and a staff competent to pass intelligently upon questions of this kind.

One of the most conspicuous services which the Railway Age Gazette has rendered to the American railway service, has been by placing emphasis upon the necessity of more adequate supervision of the work of the rank and file of the organization. This is just as applicable to the work of a \$35 clerk in the office of the auditor of freight receipts as to the work of a section hand. In the neglect of this factor of supervision arises probably the largest single item of waste which may be found in the \$60,000,000 expended annually for salaries for general office work. Improvement in supervision is a problem; first, as to methods, and second, as to personnel. Better methods could be acquired through a more extensive and intimate study of the accumulated experience of others engaged in the same kind of work. Improvement in the personnel is largely a problem of finding an individual suitable for the work to be done. This, without question, is the foremost problem before those responsible for the management of the railroads at the present time.

Roughly, the history of railway development in the United States might be divided into four periods. Thees are, first, period of construction; second, period of consolidation and system building; third, period of perfecting the physical plant; fourth, period of complete utilization of the talents of the individuals comprising the organization.

The railways are just entering into the fourth of these periods of development. In the last analysis all of the acute problems of organized railway labor and the incidental evils which have arisen are due to lack of appreciation of this factor of railway organization.

Certain classes of labor have overcome, at least from their individual points of view, certain of the difficulties inherent in their position. Certain other classes, notably general office clerks, have been unable to assert themselves in this manner. The result has been that one of the best places for the acquisition of a certain type of experience is regarded as a grave yard for ambitious railroad men. This is a most regrettable situation, for with the increased complexity and difficulty of the problem which confronts the present day railroad executive the ability to understand and interpret representative data is imperative.

As already indicated, general office clerks as a class are not organized; the conditions surrounding their work covering compensation and advancement have not materially changed during a long period of years, and quite generally promising talent is uniformly neglected, as has been the case in the past.

There are two classes of individuals which must make up every organization—first, the large group including those whose possibilities of growth and development in the organization have rather fixed limitations; second, a very considerable group of individuals who give every promise of large usefulness if properly developed.

The methods of handling work which prevail in most organizations, are such as to preclude all but individuals possessing the most extraordinary initiative and ability from asserting themselves and attracting favorable attention to their possibilities.

Scores of industrial organizations have found it tremendously profitable to specialize in the human element in the business. This involves more particularly an acquired estimation of the possibility of the individual who is taken into the organization and a consistent appraisal of the development which that individual makes as a member of the organization. Until recently there were but two of the large railways of the United States which maintained bureaus which specialized in employment conditions.

There is a very exceptional opportunity for those in charge of general office clerks in this direction. Employees of this class should be selected with reference to their fitness for the particular positions for which they apply, and second, with reference to the promise which they indicate for future development. It is impossible under present conditions to expect that every individual chief clerk can be a specialist along these lines. It

is essential that he receive the co-operation and assistance of a bureau, which is able to devote its specialized attention to this particular problem.

In summary, we have noted that the railways of the country are spending a tremendous sum of money for work of this character, that the amount expended has increased with rapidity during the past decade, that a very considerable portion of this is represented in uneconomic appliances, improper methods of organization and inadequate supervision, and that more particularly there is imperative need for more intelligent attention to the problem and possibilities latent in the personnel of the organization. Such a result can best be accomplished by creating two bureaus; one to specialize in appliances and methods, the other to specialize in men. Such a development would pay its way in any organization.

THEODORE VAIL ON GOVERNMENT OWNERSHIP

The following are a series of extracts from the American Telephone & Telegraph Company's annual report for 1913, which although the report itself relates specifically to public ownership of telephones are of general character and apply also to the question of government ownership of railroads:

Should government operation be self-sustaining in its full significance, entirely maintained and operated out of its own revenue, or should such properties be operated at a charge on general revenue at the cost of the whole public for the benefit of a part? Should they be regulated as to efficiency and sufficiency as private utilities are regulated, or should each department or utility regulate itself? If utilities are to be subsidized, that is, maintained entirely or in part out of public revenue for the benefit of the users, then the tendency toward government ownership is strong. There may be some things which should be made free and convenient for the whole public even at the expense of the public revenues, but the telegraph and telephone are not of them.

The power or right of the government to own and operate utilities need not be discussed. If such power is to be exercised it becomes of the greatest importance that a right decision, based on an exhaustive study and a thorough understanding of facts, conditions and possibile results, should be reached.

The greatest embarrassment in dealing with many public or quasi-public questions is the difficulty of establishing a clear understanding unaffected by prejudice or partisanship; of offsetting erroneous impressions, created by mistaken or misleading statements and disputable and controvertible statistics, particularly when such statements are made by those who have the public ear.

Dickens said, when a parliamentary reporter: "Night after night I record predictions that never come true, professions that are never fulfilled, explanations that are only meant to mystify." It was so then, is now and probably ever will be the same.

The functions of government and the causes of its being are "Control" and "Regulation"—control of the individual and regulation of the community so far as is necessary to secure the enjoyment of life, liberty and happiness by all, and "control" or "regulation" of anything that might in any way become a menace to the social organization or to its individual members.

To the extent that anything is a necessity in its absolute sense to the enjoyment of life and health—the absence of which would endanger the community as a whole—it is a proper function of the government either to provide it or to see that it is so provided as to bring it within the reach of every individual member of society; even to provide it for all at the cost of the general revenue.

To the extent that anything of a utilitarian nature is adopted by or assimilated into the habits of the public and contributes to their comfort, convenience, or even generally to their profit, it should become an object of sufficient government regulation to

prevent the public convenience being made the cause of private exaction; the distinction between what should be furnished in whole or in part by the government and what should be regulated by the government being whether the necssity is absolute and the thing indispensable to the life, health and well-being of the individual and consequently of the community, or whether it be something contributing to or even important, but not indispensable, to the comfort, convenience and profit of the community or of the individual.

A sufficient supply of potable water available to all is a necessity. The street car, the electric light, the telephone or telegraph are conveniences of the highest importance but are not necessities in the foregoing sense.

The control, and later the operation, of the mails and posts, for the interchange and dissemination of intelligence—letters, books, periodicals—have by general acceptance become a proper governmental function. The conveyance of packages and parcels has by custom been included with the mails.

The step from government control and regulation to government ownership and operation is radical and fundamental; one which absolutely changes the character of government organization and functions. In this country there is no organization or function of the government that in any sense approaches ownership or operation in the real, large way.

There are no sound reasons given or real advantages promised for government ownership and operation which do not apply to or cannot be secured by government regulation. Most of the "advantages" promised and arguments used are purely hypothetical, theoretical and uncertain, they are not vindicated by the experience either of this or of any other country.

Governments have in the past taken over or constructed and operated all kinds of utilities where political, national or strategic exigency made it necessary. Such operations, other than those to meet national crises, have properly been confined, wholly or in part, to such as were of a national character and where the risks and uncertainties or magnitude placed such operations beyond private initiative, enterprise and capital.

There is, however, no reason for government ownership and operation where private initiative and enterprise are not only competent to develop, but have actually developed, these utilities to the fullest extent. The government never has taken the initiative in the introduction of any new and untried utilities, nor any interest in them except so far as it has encouraged their development in private hands through the provisions of the "patent," "copyright" and "trade mark" laws; and there is no reason why it should unless such utilities have become of such general use that their regulation is necessary.

The general stock arguments put forth for government ownership and operation are:

Extension of benefits to a larger public;

Abolition of selfish exploitation;

Control of monopoly;

Pecuniary advantages to the public through lower cost and consequently lower charges;

Greater efficiency;

Saving to general public rewards of private initiative.

Private enterprise is rightly said to be based on personal interest. There is no doubt as to this, but incentive to achievement along individual lines could not be suppressed without great detriment to the community at large. What would be the result if government restrictions reduced the reward or profit on initiative and enterprise to that of certain and secure business ventures? Where would be the incentive to assume risk and uncertainty, or the larger profit necessary to recoup the individual and the community for the unsuccessful ventures?

The pecuniary reward to those who take the initiative and the risks of new enterprises must correspond to the labor and to the risk, but this reward cannot exceed the advantage to the public using the service, for the user must get in service. in some way at least, the equivalent of its cost to him. Private initiative, invention, enterprise, risk, spurred on by the incentive of reward,

have changed the face of the world, and the resulting unearned increment largely constitutes the wealth of nations; without it many of the great scientific industrial developments would have remained scientific curiosities, even if they had been evolved at all.

The general tendency in this country is to the "one system" idea of public utilities under regulation. Every one knows the evil of duplication, no one wants two gas, water or electric lighting systems, and there is a general acquiescence in the "single system" in each community. In no one of the utilities except the telephone, and the street cars to a slight degree but for a very different cause, does the fact whether A, B or C residing in the same community is on the same or different "systems" make the slightest difference as to service, nor does it matter whether systems in different communities are connected or not.

With the telephone exchange the question of those connected is vital; your service depends upon one system connecting all telephone subscribers in the same community and upon all communities being connected with each other.

A telegraph system reaching all telegraphic points avoids physical transfers from one system to another, with the incidental delays and obstructions to good service.

Telephone and telegraph systems operated under common control can avoid duplication by making use of the same wires.

For practicability of management, economy of operation or efficiency of service there should be one combined telephone and telegraph system. This has been the Bell contention and this is the conclusion reached by the post office committee and by Congressional advocates of government ownership, who say in substance that the telephone and telegraph should constitute one system and that a monopoly.

Government regulation can effectually curb "monopoly" and "selfish exploitation" and make them useful without destroying them, by subordinating them to the public for the public advantage. Government ownership and operation would destroy individual initiative; they would create monopoly and increase and strengthen its evils by placing it in the control of officials and servants, responsible only to themselves as a political party, and parts of the organization which made or unmade the chief executives.

Operation, economical and efficient, requires high organization continuously maintained, superior methods and efficient service. There must be supervision by able executives assisted by experts, all of long experience as executives as well as in the particular industry. They must have large discretionary powers, assume responsibility, and have undisputed directive authority over subordinates. It is purely administrative and executive in its nature.

There is a very narrow margin between efficient economical operation and waste. It is possible to have efficiency accompanied by waste, but never possible to have efficiency without responsible organization and the individual initiative, watchfulness and continuing interest which only accompany permanency and expectation of reward.

Regulation is in the nature of a review, consideration, determination. It is judicial and advisory, not administrative or executive; a commission of regulation is analogous to a board of direction representing the public as well as the corporation, having no other object than the conservation and protection of the interests of all.

Operation is a methodical action upon lines of a determined policy, requiring expert knowledge, experience, training, and individual interest.

Regulation is common sense, intelligent review and decision, based on presentation and examination of facts and conditions.

Theoretically there may be no reason why government operation should not be as economical and efficient as private operation, but actual constructive performance runs up against actual conditions and tangible difficulties which only experience shows how, and responsibility develops the ability, to deal with.

Departmental officers taken from walks of life affording neither experience nor knowledge of the duties and responsibilities they are to assume, are expected to perform the various duties of their departments and also to incidentally look after their political obligations. As a rule their training better fits them for advocates than for executives, for judicial positions or as commissioners of regulation than directors of operation.

Every new head of a department is of necessity a reformer; his average incumbency is less than four years; there is seldom any continuity of departmental policy, and never any continuity of departmental staff. The important assistants come and go with the head. A review of the operations of his department shows much that could be changed to advantage; to eliminate all that is unsatisfactory and bring about effective results under the conditions and in the time available is impossible for the ablest. He starts in finding an incomplete attempt at accomplishment along a certain line of policy, and goes out leaving an uncompleted attempt along a different line of policy. The inevitable tendency is towards promise, not performance.

The departments are run by the minor officials and the clerical force who under ordinary conditions are permanent. The officials have no responsibility in the selection of and little directive control over their subordinates. There is a premium on that finished mediocrity which leaves much to be desired and furnishes nothing upon which to base effective reprimand, enforce discipline, or cause for removal. Lack of responsibility is a handicap in the development of men; lack of accountability is a handicap on thorough efficiency; lack of opportunity is a handicap on initiative and enterprise.

A full average of the minor heads and clerks would normally have capacity, initiative, enterprise and ambition. If any one of them develops extraordinary efficiency, initiative or enterprise, he is either elbowed out of the way as disturbing the quiet, complacent habitude of the organization, or, if sufficiently masterful, develops to a point where he can go no farther, and is soon taken up by outside organizations. The higher positions, honorable as they may be, are not sufficiently compensated and do not afford the permanent and remunerative positions to be had in private enterprises for similar occupations and ability.

In European countries, where even the minor office holders and government employes have a certain official distinction which also attaches to their families, there is something higher than the mere remuneration, something that does not attach to private occupation, and is not attached to government subordinate positions in this country.

Government administration is more or less a game of politics, and while with government operation it may sometimes be possible to have efficiency, it will always be impossible to have economy.

RAILWAY EXTENSION IN AUSTRALIA.—The New South Wales and Australian governments have arrived at an agreement respecting the construction of proposed railways from Moama to Moulamein; from Euston inland about 50 miles and from Wentworth inland, about another 50 miles. These lines, when constructed, will be operated by the Victorian Railway department, on the Victorian gage under an interstate agreement.

ELECTRIC RAILWAYS IN AUSTRIA.—Statistics issued for 1913 show that in Austria, Bosnia and Herzegovina there is a total of 73 direct-current railway systems, of which 25 operate at 750 volts or more; and six single-phase systems. Twenty-four of the railways are operated on standard gage and 55 on narrow gage. The length of the direct-current lines is about 723 miles, and of the alternating current lines about 150 miles, or 873 miles in all. During the year the increase in the number of direct-current lines was 12 and single-phase lines three. The increase in the length of direct-current lines was 92 miles, and single-phase lines 106 miles.

General News Department

The Grand Trunk roundhouse at West Forty-ninth street and South Kedzie avenue, Chicago, was destroyed by fire on July 5, and 18 locomotives were damaged.

The New York, New Haven & Hartford has just pensioned 13 employees, making 51, altogther, retired within three months. One of those who have just been pensioned is George C. Crocker of Hyannis, Mass., a crossing man, 82 years old, who has been in the service 59 years.

The Pennsylvania Railroad, since January 1 last, has sold 100 pieces of real estate for approximately \$1,000,000. The directors have voted to sell, as fast as purchasers can be found, all of the real estate owned by the company which is not needed for its uses, of which there are 647 separate parcels. Station agents of the company will give all desired information.

Engineers and firemen of the railroads west of and including the main line of the Illinois Central who have been taking a strike vote in connection with their demand for increased wages and important changes in working conditions, which were denied by the railways some weeks ago, are reported to have voted overwhelmingly to empower the leaders to declare a strike. Conferences between the representatives of the men and the general managers' committee are to be resumed in Chicago on July 14.

According to press reports from Portland, Ore., about a dozen passenger conductors on the Oregon-Washington Railroad & Navigation Company have been dismissed in the last few weeks as the result of the discovery of numerous irregularities in collecting cash fares. A rigid investigation is said to have disclosed evidence against 38 conductors. The Order of Railway Conductors and the Brotherhood of Railway Trainmen are said to have issued a circular on the subject warning the men against such practices.

The Railway World, studying the last annual report of the Interstate Commerce Commission, finds that in June, 1913, the number of persons employed was 852. The list includes 10 chiefs of divisions, 32 attorneys, 75 examiners and 501 clerks. This statement evidently was made before many persons were engaged in the valuation division, as only the five engineers are mentioned under that head. The appropriations made by Congress for the work of the commission for the last fiscal year amounted to \$1,853,629. In 1888 the number of persons employed by the commission was 33 and the expenditures in that year were \$113,008.

The New York State Workmen's Compensation Commission reports that the railroads are no longer opposing the application of the workmen's compensation law. They are insuring their risks, some having taken out policies in the state fund while others have given their business to the stock insurance companies. Still others insure their own risks. The distinction between intrastate and interstate employees in applying the law to the railroads is still an unsettled question, and decision in the matter probably will be held in abeyance until the first claims are filed. Four hundred claims for compensation had been filed up to July 8. It was found that only four of these were death claims.

Officers of the shop craft unions which struck on the Illinois Central and Harriman lines in 1911 are gathering a large amount of evidence, in connection with the strike, with a view to presenting it to the United States commission on industrial relations. The committee says it is the intention to show that this was not a strike but a "lockout," resulting from the refusal of the roads to recognize their federation. An effort is being made to locate all of the men who struck, and question blanks are being sent out to ascertain how many have lost homes on account of inability to make payments, whether children have been obliged to go to work, whether any of the strikers or members of their families have committed suicide, etc.

The Indian Railway Board has recently placed orders for two shipments of railway ties to be shipped from the Pacific coast. One is of creosoted Oregon pine at a cost of \$1.44 per tie delivered Calcutta, and the other of uncreosoted Californian redwood at \$1.20 per tie. The dimensions are 9 ft. by 10 in. by 5 in., and are for the state broad-gage railways. The reasons given for going to the United States for ties are that the cost of Australian jarrah has gone up to \$2.80 per tie, and that these orders have been given after satisfactory experiments with Pacific coast timbers to see that they resist the ravages of white ants and do not show undue deterioration from the tropical climate. It is also stated that the Indian government requires between 500,000 and 1,200,000 ties a year for the state railways of the country.

Cash Investment of the Railways During Six Years

During the six fiscal years 1908 to 1913, inclusive, the steam railways of the United States of Class I invested in their road and equipment cash to the amount of \$4,010,385,303. Railways of Class I, so designated by the Interstate Commerce Commission, are those with annual operating revenues of over \$1,000,000. They include about 90 per cent. of the mileage, receive more than 96 per cent. of the revenues, and handle more than 98 per cent. of the traffic.

This cash investment of the operating railways of Class I of the eastern district during the six years was greater than the amount of capital securities issued by them during this period, and was 19.9 per cent. of the aggregate of their capital securities outstanding June 30, 1913; of the railways of the same class of the southern district it was 21.1 per cent., and of the railways of the same class of the western district it was 23.2 per cent. of the aggregate of their capital securities outstanding June 30, 1913. That is, the cash actually expended by these railways during the last six years upon their properties used in transportation amounts to more than one-fifth of their total capitalization at the close of the last fiscal year. This is at the rate of \$668,397,551 per year.

These figures are obtained through a compilation made by the Bureau of Railway Economics from the reports of the railways to the Interstate Commerce Commission, and have not heretofore been collated.

Extensive Under-Studying on the Baltimore & Ohio

To broaden the knowledge of its division officers and give them the benefit of a thorough training with respect to the methods of administering the affairs of the company in the general offices at Baltimore, the Baltimore & Ohio is putting its division officers through a course of employment which will better equip them for promotion to positions of greater responsibility. Assistant superintendents, trainmasters and, in some instances, their subordinates, are transferred to Baltimore and set at work where they can study the problems of operation from the viewpoint of the general officers. While the staff officials are thus engaged their subordinates discharge the regular duties of the office. The plan, therefore, has the added advantage of equipping the men lower in rank to qualify when vacancies occur.

The men who take the course in the general offices are employed for a period in the transportation department; then in maintenance of way work, in the motive power office, the accounting and statistical departments, and in the tonnage, discipline, employment, station service, rates of pay and other bureaus, so that when they return to their respective divisions it will be with a general knowledge of the relation of their work to the operation of the property as a whole. Several of these men are in the Baltimore offices constantly, and when they go back to their regular duties others are brought in.

REVENUES AND EXPENSES OF RAILWAYS

rage mile	age	-Operating revenues	S	MONTMaintenance	H OF	MAY, 1914Operating	expenses			Net	Outside		Operating	Increase (or decr.)
Freig	asse	ger.	Total.	Way and	Of equipment.	Traffic.	Trans- portation.	General.	Total.	revenue (or deficit).	operations, net.	Taxes.	income (or loss).	comp. with last year.
309 274,330 173,142 292 114,190 40,429 110,450 71,045 9,204 367 202,335 36,520	40,429 9,200 36,520	1772#0	\$133,979 410,163 167,381 82,994 251,029	\$21,944 \$55,552 24,408 9,824 30,378	\$39,525 140,888 12,593 7,924	\$4,365 13,225 5,768 855 2.047	\$52,330 146,545 62,366 13,410 64,781	\$5,801 14,944 8,362 2,643 11,146	\$123,965 371,154 113,497 34,656 132,361	\$10,014 39,009 53,884 48,338 118,668	-\$259 -1,277 -69 336	\$7,250 15,948 13,770 3,000	\$2,505 22,239 40,045 45,338 106,744	-\$23,425 -68,990 -2,659 6,391 27,830
4,861,004 2 44,863 154,181 76,107 2,108,874	2,043,236 40,676 52,109 21,602 709,981		7,556,173 95,828 230,949 107,407	988,344 12,682 41,999 6,254 435,239	1,259,152 21,679 32,168 19,603	165,437 5,897 14,436 3,821 53,561	2,225,101 34,608 99,880 56,101	144,151 4,780 12,549 3,867 100,781	4,782,185 79,646 201,032 89,646 2,314,789	2,773,988 16,182 29,917 17,761 741.093	657	388,530 7,125 14,337 10,157	2,385,458 8,400 15,580 7,604 627,540	-222,201 -3,904 -431 61,525 17.049
5,752,513 1 247,133 711,377	1,316,431 652 44,190 29,022	1	7,586,213 113,494 305,068 258,921 750,265	847,571 6,494 54,268 20,324 78,402	1,506,434 23,273 38,294 23,146 207,236	163,940 671 2,242 616 8,965	2,965,665 52,661 79,705 92,289 169,822	184,922 7,071 10,271 7,886 11,536	5,668,532 90,170 184,780 144,261 475,961	1,917,681 23,324 120,288 114,660 274,304	71,559	318,554 19,021 8,789 11,063 18,000	1,527,568 5,342 111,834 103,597 256,304	—874,404 —25,315 730 11,588 —226,435
154,913 4,991 47,379 1,433 2,286,708 1,222,965 62,439 6,208			160,543 87,079 3,820,868 73,054 21,847	15,710 12,570 404,782 24,186 4,468	23,505 14,058 721,801 33,023 7,486	896 896 34,895 1,063 484	25,313 30,248 1,719,134 27,336 12,963		67,548 60,687 3,015,582 92,070 28,771	92,995 26,392 805,286 -19,016 -6,924	14,656	2,978 1,614 171,970 2,600 1,600	90,017 24,778 647,972 —21,616 —8,646	-6,863 -7,501 6,039 10,828
91,593 10,908 25,439 16,479 1,563			770,113 124,560 86,147 197,077 10,275	172,653 17,750 30,477 16,938 1,371	176,431 24,559 14,004 27,020 82	11,731 586 7,399 7,080 1,946	283,877 37,925 36,980 41,445 2,190		667,709 84,953 93,706 102,452 6,200	102,404 39,607 7,559 94,625 4,075	-296	24,000 2,500 15,000 14,250 750	77,838 37,107 22,559 80,375 3,325	-224,862 -2,174 14,959 -44,606
554,934 304,395 257,993 37,458 244,934 70,017 108,488 30,192 660,039 306,725		2,110	953,620 310,002 336,216 146,574 1,064,378	178,225 90,916 40,320 34,412 121,761	208,668 42,438 55,257 30,525 250,250	40,270 7,883 4,502 41,394	389,138 95,959 157,236 60,760 424,286	42,569 3,744 7,496 7,387 35,200	858,870 233,772 268,192 137,586 872,891	94,750 76,230 68,024 8,988 191,487	6,897 86 5,559 4,683	52,360 11,500 16,980 5,000 55,200	49,287 64,816 56,603 3,988 131,604	40,529 —61,138 —30,614 11,988 —23,972
736,060 230,187 298,945 60,251 3,958,206 1,700,953 4,331,505 1,587,999 760,319 236,949		1,06 6,46 6,52 1,09	1,066,400 402,377 6,465,427 6,520,269 1,090,017	120,920 63,916 1,399,206 1,461,133 171,499	282,413 93,818 1,028,201 1,241,987 214,101	23,285 22,718 108,257 121,060 45,944	435,794 213,216 2,535,350 2,288,102 425,583	41,059 13,473 143,920 203,678 39,036	903,471 407,141 5,214,934 5,315,960 896,163	162,929 2,764 1,250,493 1,204,309 193,854	-1,522 -4,097 1,572 4,231 -720	\$6,900 9,004 385,000 304,327 46,107	104,507 -17,865 867,065 904,213 147,027	598,747 -42,324 -535,417 -219,563 -47,303
300,746 22,693 364,242 160,432 41,929,689 1,436,871 105,852 22,858		333 575 161 6,970 136	333,589 575,382 161,259 970,871 136,607	38,121 91,744 91,18 935,195 25,283	86,493 87,508 17,989 960,326 32,439	19,245 19,245 957 139,717 6,005	123,886 223,517 84,591 2,641,286 63,997	11,556 17,664 4,101 154,495 5,118	270,166 439,678 116,756 4,831,019 132,842	63,423 135,704 44,503 2,139,852 3,765	9,810 28,421	18,600 32,665 1,229 338,054 8,700	45,481 103,039 53,084 1,830,219 4,935	27,865 -58,733 -8,787 25,320 -8,870
132,547 43,353 3,052,058 1,338,591 4, 785,653 426,897 1, 16,484 669,077 122,551		194 4,744 1,303 149 882	194,461 744,367 303,725 149,668 882,852	38,207 789,695 374,390 29,202 180,406	29,144 824,450 212,140 48,657 150,682	10,007 143,837 30,719 3,434 18,903	96,408 2,140,537 545,944 49,257 431,914	7,464 152,751 38,560 9,655 21,853	181,230 4,051,270 1,201,753 140,205 803,758	13,231 693,097 101,972 9,463 79,094	-12,559 -12,559 -358	8,815 226,489 84,038 11,500 49,765	3,897 454,049 19,434 —2,395 29,329	72,842 530,989 252,218 6,118
726,850 154,130 79,074 15,001 1,739,835 715,393 104,098 18,556 397,286 100,509		2,711. 13. 13.	929,112 100,109 2,713,309 135,402 544,520	100,550 16,662 444,412 33,495 95,863	233,704 23,403 628,205 34,366 85,457	25,929 2,582 64,410 7,932 8,946	283,007 47,917 1,201,494 64,985 216,717	28,792 3,442 65,928 5,919 21,083	671,982 94,006 2,401,449 146,697 428,066	257,130 6,103 308,860 -11,295 116,454	-1,632 -1,365 -7,876	31,000 6,000 124,500 10,000 35,625	224,498 103 185,725 —29,171 80,900	-61,939 -12,026 -7,326 -1,436
193,010 54,015 1,604,503 214,660 2,471,357 705,634 1,311,663 360,366 86,336 18,982		259 1,897 3,414 1,751	59,993 97,438 14,174 51,378 09,562	38,407 123,580 595,968 276,051 18,847	30,891 266,840 501,915 294,744 20,456	4,352 26,008 67,512 37,096 1,686	84,842 721,464 1,024,189 519,317 39,520	8,041 70.254 73,376 48,907 4,710	1,208,146 2,262,960 1,176,115 85,219	93,460 689,292 1.151,214 575,263 24,343	-131 -2,277 43,025 -4,979	5,910 56,250 185,000 70,000 4,500	87,419 630,765 1,009,239 500,284 19,843	-10,820 -9,132 -156,963 96,092 5,795
67,658 24,248, 133,000 48,700 93,094 9,227 502,344 19,892		100 202 112 529	97,453 100,913 202,064 112,777 529,495	15,854 12,347 45,541 136,085 95,532	16,494 8,285 35,846 64,416 52,482	2,051 1,863 6,535 2,748 1,044	34,622 35,545 119,440 66,151	3,070 2,596 6,603 5,990 10,109	72,091 60,636 213,965 275,390 275,475	25,362 40,277 —11,901 —162,613 254,020		9,135 5,600 3,600 5,700 26,771	15,219 34,677 —15,326 —168,313 224,809	—15,822 —27,200 4,421 —123,460 —328,890
604,714 31,652 171,777 87,787 84,374 18,434 614,352 111,710		27. 10. 75.	643,033 274,857 105,676 756,997	145,044 95,021 21,666 93,494	85,770 39,976 28,805 101,482	2.884 11.093 1,230 20,080	117,370 99,458 40,624 222,520	12.050 12.154 5.613 24,483	363,118 257.703 97,938 462,059	279.915 17.155 7.738 294,938	2,878	32,639 19,600 5,284 38,210	250,154 4,739 2,454 241,558	-562,777 -31,364 -58,222 27,928
793,115 4 12,568 159,204	4	79 10 10 54	798,367 4,211,318 103,255 543,178	128,530 306,082 9,326 74,425	164,202 694,894 10,476 53,124	7,542 109,149 2,265 7,238	229,857 1,458,467 31,223 140,315	22,476 112,038 4,196 11,037	552,607 2,680,630 57,486 286,139	245.760 1.530,688 45.769 257,039	48,971	45.595 116,413 9,198 20,000	200,165 1,365,304 36,571 237,045	-278,930 -244,326 -7,595 144,118

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY, 1914 CONTINUED

Aver	Average mileage		Operating revenue		Maintenano	Jance	-Operating expense	expenses			Net	Outeide		Onerating	Increase (or decr.)
Name of road.	during	1	9	Total.	Way and	jo.	5	Trans-	,		revenue	operations,		income	comp. with
	period.	Freight.	Passenger.	inc. misc.	structures.	equipment.	Traffic.	partation.	General.	Total.	(or deficit).	net.	Taxes.	(or loss).	last year.
Galveston, Harrisburg & San Antonio Georgia, Southern & Florida. Grand Rapids & Indiana	1,338	\$569,541 105,456 273,167	\$263,096 70,244 120,470	\$900,295 201,305 431,294	\$170,603	\$178,420 39,832 76,542	\$33,119 9,736 10,542	\$429,304 75,075 174,831	\$36,565 10,318 16,454	\$848,011 166,420 337,217	\$52,284	-\$2,760 -238 -1.282	\$45,651	\$3,873 23,473 68,574	-\$143,314 15,136 26,779
Grand Trunk Western Great Northern	7,804	380,000	1,097,985	5,867,557	1,678,042	103,979	20,936	1,645,585	18,476	527,195	1,507,276	7,115	31,500	14,518 888,185	-1,044,456
Gulf & Ship Island	308	107,409	29,869	146,484 920,946	20,731	35,918	25,939	46,753	9,509	115,753	30,731	69	7,289	23,511	-35,878
Hocking Valley Houston, East & West Texas Houston & Texas Central	789 789	330,317 75,878 271,316	30,278 124,299	442,016 112,006 428,607	25,379 106,035	2,571	11,822	163,327 36,185 238,369	13,854 4,035 19,496	79,915 444,118	32,091 -15,511	-226	38,400 4,916 27,612	27,175	27,455
Illinois Central Indiana Harbor Belt	4,763	3,475,848	1,053,059	5,182,356	738,956	1,172,857	3,017	1,951,771	120,272	4.091,431	1,090,925	3,959	257,000	833,206	3,784
International Great Mortnern Kansawa & Michigan Kansas City Southern	177	205,034	30,543	243,293 886,186	38,640 110,910	48,836 104,711	2,836	304,238	6,929 43,010	176,290 590,114	296,072	620—	11,400 67,125	55,524	-45,815
Lake Erie & Western	1,854	350,230	66,651	446,214	69,553	86,337	15,348 85,052	193,054	11,394	3,059,143	70,528	51,144	24,000	46,528	-28,758
Lehigh & Hudson River Lehigh & New England Lehigh Valley	293	250,295 2,984,876	397,444	161,206 260,850 3,516,422	36,872	20,199 43,561 548,480	2,063 92,455	55,515 58,351 1,136,105	5,808 5,165 71,107	96,322 146,012 2,253,412	64,884 114,838 1,263,010	54,960	5,670 137,000	00,884 109,168 1,180,970	15,570 126,881
Louisiana & Arkansas	398	319,774	718,960	1,153,804	132,968	113,815	11,529	472,344	24,928	755,584	398,220	12,790	64,080	.346,930	21,816
Louisiana Ry. & Navigation Co Louissiana Western Louisville & Nashville	351 208 4.941	126,804 120,301 3,188,019	23,963 57,760 1.026,232	160,852 187,297 4.514,075	27,147 28,248 814,409	20,262 35,978 989,790	7,576	65,755	5,673 6,881 93,214	124,932 139,994 3,698,501	35,920 47,303 815,574	5115	7,500	28,420 37,253 594,438	9,858 -25,467 -137,431
Louisville, Henderson & St. Louis.	200	65,399	36,385	108,907	20,945	14,738	5,211	36,640	33,120	80,654	28,253	404	3,600	24,249	3,749
Michigan Central	1,800	1,657,912	38,272	2,606,439	313,269	456,923	67,108	1,116,863	57,411	2,011,574	594,865	-1,854	134,000	10,568	304,540
Minneapolis & St. Louis	4,065	1,454,496	139,122	2,041,674	334,355	329,000	52.733	732,233	50,150	1,498,471	543,203	1,077	33,649	453,801	-166,634
Missouri, Kansas & Texas System	3,865	1,380,268	32,342	2,194,849	318,511	20,597	3,834	42,033	5,885	99,528	642.589	874	5,500	523,180	64,293
Missouri, Oklahoma & Gulf	332	52,606	19,279	75,109 8,039	27,129	14,417	253	5,592	6,441	97,423 8,294	-22,314	231	6,461	-28,544 -451	-5,817 4,290
Missouri Pacific	3,920	1,438,370	379,497 2,889	1,999,202	346,526	398,125	53,068	813,020	108,059	1,718,798	280,404 53,714	4,296	100,383	175,725	-400,514
Monongahela Connecting	405	237,110	101,335	362,695 1,014,190	10,802 57,447 144,226	11,185 51,643 189,427	300 12,541 43,372	41.571 161,508 405,679	3,872 12,310 32,070	67,730 395,449 814,774	2,058 67,246 199,416	2,047	23,612 23,612 29,400	41,587	8,291 -55,321
Newada Northern New Orleans & North Eastern	165	130,449	12,686 50,303	146,498	24,450	20,618	10,948	31,912	6,485	83,959	62,959	198	7,200	55,339	-15,170 $-20,184$
New Orleans Great Northern New Orleans, Mobile & Chicago New Orleans. Texas & Mexico	283 286 286	136,399 136,399 98,009	31,151 28,298 18,314	174,770 174,770 125,836	32,588 48,054	25,137 31,613 20,504	2,094 4,045 4,961	55,905 57,761	8,090 10.937	95,276 132,241 142,217	53,265 42,529 -16,381	- 23	3,330 6,183 1,000	36,346	-23,670 $-13,053$ $7,276$
New York Central & Hudson River	3,756	5,116,410	2,767,341	8,917,463	1,276,599	1,692,487	170,126	3,260,359	217,568	6,617,139	2,300,324	—59,461 —1,984	559,626	1,681,237	-537,250
New York, New Haven & Hartford 2 New York, Ontario & Western New York, Philadelphia & Norfolk.	2,007	2,785,007 601,060 276,281	2,259,250 121,080 36,466	5,580,765 760,980 337,520	833,810 88,999 31,623	794,440 133,362 64,760	40,182 11,207 3,874	2,188,235 292,485 150,480	172,480 16,158 15,029	4,029,147 542,211 265,766	1,551,618 218,769 71,754	8,440	300,000 23,500 8,700	1,260,058	307,979
New York, Susquehanna & Western.	2,037	3,259,946	46,816	3,760,982	13,312	26,273	2,289	101,149	79,160	141,608	139,722	1,869	5,298	1.04, 71	46,137
Norfolk Southern Northern Central Northern Pacific	860 472 6.314	220,016 788,210 3.561,250	202,668 1,162,336	320,482 1,064,305 5,076,147	61,346 147,548 783,584	47,271 222,915 570,647	5,825 14,720 101,066	125,465 495,084 1,685,006	20,087 26,188 67,957	259,994 906,455	60,488 157,850 1.867,887	3,561 1,216 770	37,044 484,656	53 72 122, 22 1.384,001	5,558 84,963
Northwestern Pacific Oregon Short Line	2,120	113,792	195,857	329,185	48,739	45,070	36,429	118,736	13,524 51,804	230,974	98,211	3,236	113,303	82,713 597,740	,
Oregon-Washington R. K. & Nav. Co Pecos & Northern Texas Pennsylvania Company	1,915	789,310 143,364 3,350,435	377,716 36,021 706,974	1,255,799 190,708 4,623,208	21,259 668,244	39,896 39,364 802,190	2,264 83,480	429,346 68,631 1,681,791	58,523 6,416 178,227	866,710 137,934 3,413,932	389,089 52,774 1,209,276	-6,981	7,236 283,953	270,808 45,538 923,235	-38,715 -4,856 -423,411
90	4,044 717 2224 1.472	9,746,396 863,432 1,124,536 2,064,136	3,070,363 712,261 146,863 692,793	13,900,292 1,772,602 1,324,046	1,822,613 262,618 145,480 460.592	2,703,999 315,173 363,133 620,657	173,918 28,066 13,602 69,843	5,038,614 735,616 344,314 1.188,168	350,743 40,634 29,182 110,603	10,089,887 1,382,107 895,711	3,810,405 390,495 428,335 692,540	-102,966 -102 -1119	597,327 56,107 53,500 163,668	3,110,112- 334,388 374,733 527,753	—384,197 118,939 —564,077
Pittsburgh, Shawmut & Northern Richmond, Fredericksburg & Potomac Rutland	282 88 468	118,637 189,973 184,745	11,128 79,753 84,676	133,486 301,571 310,013	15,628 33,284 37,632	36,449	1,456 3,458 9,654	45,952 103,508 135,036	7,536 8,294	103,944 177,806 243,006	29,542 123,765 67,007	132	1,822 7,500 17,487	27,720 116,133 49,456	2,627
of, Joseph w Grand resource	210	400,00	20,000	100000		50,000	1,000	00,710	0,010	160,600	2,000		0100	10,710	2116

4Figures stated here are for period January 1-May 31.

			RAILWAY AGE GAZETTE
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		last	7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.
	Operating		713,590 28,536 29,538 21,500 20,00
		Taxes.	27,985 1,286 1,280 1
	Outs:de	Outside operations, net.	\$1,214 \$1,214 \$1,214 \$1,056 \$1,096
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PAILWAY	9	expenses	Transportation portation property and property processes a second processes and processes are processes and proc
	OF	Bu	Traffic. \$\$5,149 56,149 56,149 56,149 23,359 42,359 42,359 42,266 112,266 112,266 113,937 113,936 111,037 13,936
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	REVENUES	Mo	Way an Way and
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			Freight, Passeng \$120,524 \$80, 1,564,596 \$120,524 \$83, 178,169 \$25, 643,755 \$13,114,792 \$2,34 \$44,446 \$1,61,387,808 \$1,104,628 \$1,104,628 \$1,109,488 \$1,109,488 \$1,109,488 \$1,109,488 \$1,109,412 \$1,10
			Average mileage during
			Name of road
1			Mexico. R Mexico. R Mexico. R South R Pac R South R Pac R South R Pac R Pac R R R Pac R R R Pac R R R Pac R R R R Pac R R R R R R R R R R R R R R R R R R R
1			of road. for froad. Southwestern Southwestern Southwestern Southwestern Southwestern Southwestern Southwestern Southwestern Southwestern Francisco Francis
1			Name oo oouis, Broouis, Broouis, Broouis, Broouis, So Louis, So Lo
1			Sound State of Table

REVENUES AND EXPENSES OF RAILWAYS

ELEVEN MONTHS OF FISCAL YEAR ENDING JUNE 30, 1914-CONTINUED

	Avera	Average mileage						-Operating	perating expenses			Net				Increase
Z	Name of road.	during	0.pe	Operating revenues	Total.	Way and O	nance	1	Trans-			operating	Outside operations,	4	Operating	(or decr.) comp. with
Chicago Chicago Chicago	Chicago & Erie Chicago & North Western Chicago & North Western Chicago, Burlington & Quincy	270 8,068 9,129	\$3,928,266 49,544,518 57,819,542	\$639,157 19,597,399 19,866,210	\$5,035,626 76,399,257 85,239,094	\$940,658 10,574,046 10,665,025	\$1,260,386 11,236,599 14,539,799	\$237,638 1,256,453 1,471,811	\$2,686,458 29,448,412 27,934,445	\$145,000 1,599,199 2,187,485		\$234,514 22,284,548 28,440,529	-\$37,182 -9,198 -146,720	. 0000		\$351,552 -\$80,781 -1,643,296
Chicago,	Indiana & Southern	359	- 1		3,995,898	1,851,152	2,160,714	99,355	1,459,107	114,939		515,195				-310,906
Chicago, Chicago, Chicago, Chicago,	Indianapolis & Louisville. Junction Milwaukee & St. Paul Peoria & St. Louis. Rock Island & Guff.	617 12 255 477			6,372,391 1,874,139 84,111,284 1,545,577 2,594,220	948,861 178,793 9,579,809 301,825 329,899	1,005,211 189,265 12,169,068 371,529 338,908	213,045 12,314 1,647,886 71,582 106,168	2,429,953 1,001,951 31,222,564 762,406 1,074,105	1,593,017 1,593,017 57,620 86,863	4,780,560 1,431,900 56,212,344 1,564,962 1,935,943	1,591,831 442,239 27,898,940 —19,385 658,277	98,296 205,985 8,900			-202,634 -44,733 -1,136,471 -511,580
Chicago, Chicago, Chicago,	Rock Island & Pacific. St. Paul, Minneapolis & Omaha. Terre Haute & Southeastern. ati, Hamilton & Dayton.	373	1		59,456,780 16,542,614 1,988,444 9,219,574	7,697,381 2,323,852 295,672 1,666,401	8,608,476 2,139,135 575,708 1,668,181	1,658,911 322,749 40,178 232,629	25,105,046 6,431,873 647,204 4,560,427	1		14,658,520 4,920,245 329,935 864,654	-155,591 11,427 -3,031		4,040,671 200,404 452,028	143,640 143,640
Cincinna Clevelan Colorado Colorado Colorado	Cincinnati, Northern Cleveland, Cincinnati, Chic. & St. Louis. 2 Colorado Midland Colorado & Southern Cumberland Valley	338		207,458 8,207,347 248,992 1,352,866 639,800	1,340,908 33,104,777 1,625,307 7,014,342 3,160,247	299,316 4,975,025 306,288 981,413 602,118	367,855 8,306,986 394,948 1,309,292 377,026	30,237 842,482 86,164 116,656 55,526	605,882 14,686,080 735,571 2,549,669 1,098,955	841 370 658 553	1,343,131 29,567,943 1,586,629 5,196,547 2,227,178	3,536,834 3,536,834 1,817,795 933,069	-15,334 -12,783 -8,515 944	64,059 1,347,168 98,000 369,696 66,886	2,174,332 2,174,332 -72,105 1,439,584 867,127	-183,593 -4,060,392 -154,539 -692,397
Delawar Delawar Denver Denver Detroit	e & Hudson Co.—R. R. Dept. e, Lackawanna & Western & Rio Grande & Sals Lake & Mackinac	960 960 237 411	17,485,744 26,139,497 15,758,426 719,715 732,324	2,857,265 7,772,857 4,675,255 303,144 310,279	21,124,897 36,355,709 21,376,419 1,077,896 1,114,274	1,616,924 4,643,674 3,093,568 203,388 130,088	3,336,970 5,655,784 3,925,654 183,663 177,681	297,835 791,363 454,064 20,570 26,212	8,078,619 11,523,555 6,729,298 371,105 409,792	741,380 775,555 579,351 49,248 29,995	14,071,728 23,389,931 14,781,935 827,974 773,768	7,053,169 12,965,778 6,594,484 249,922 340,506	—10,061 396,653 —14,437 —987	1,915,000 948,600 45,500 96,756	6,438,751 11,447,431 5,631,447 204,422 242,763	1,526,166 -1,580,450 -477,567 -2,746 -28,306
Detroit Detroit, Detroit, Duluth	& Toledo Shore Line. Grand Haven & Milwaukee. Toledo & Ironton. & Iron Range.	79 191 441 281 360	1,436,990 1,406,967 1,135,175 5,387,662 6,157,353	593,053 124,214 267,064 354,089	1,450,709 2,321,901 1,385,104 5,760,896 6,589,375	-	116,762 336,753 530,092 702,513 966,951	19,119 74,809 28,514 12,303 25,903	416,809 1,287,818 884,374 1,432,985 1,432,482	310 382 450 733	722,474 2,074,909 2,111,542 3,110,797 3,697,067	728,235 246,992 2,650,099 2,650,099 2,892,308	983	61,030 39,600 62,700 307,550 369,487	667,205 208,375 789,138 2,322,832 2,539,637	83,733 162,859 -642,152 -545,270
Duluth, Duluth, El Paso Elgin, J	Duluth, South Shore & Atlantic. Duluth, Winnipeg & Pacific. El Paso & Southwestern. Elgin, Joliet & Eastern. Erie	627 181 998 796 ,988	1,929,596 1,328,096 6,717,516 9,800,099 35,136,279	1,013,766 258,979 1,142,592 8,743,180	3,142,625 1,616,594 8,221,491 10,490,472 47,770,791	5,1,1	393,664 305,191 1,136,280 2,245,122 9,189,309	96,973 23,590 185,548 65,798 1,158,801	1,193,259 609,207 2,350,416 3,122,952 17,217,713		2,505,906 1,257,817 5,124,864 7,211,739 34,115,268	636,719 358,777 3,096,627 3,278,733 13,655,523	3,988	218,035 80,854 449,013 403,484 1,656,766	2,609,540 2,875,249 2,875,249 11,656,048	14,118 -93,214 -271,438 -2,093,924 -3,095,091
Florence Florida Galvesto Georgia, Grand	Florence & Cripple Creek Florida East Coast Galveston, Harrisburg & San Antonio. 1 Gaorga, Southern & Florida. Grand Rapids & Indiana.	685 338 395 575	922,109 2,417,238 7,317,629 1,338,300 3,020,635	1,956,253 2,959,366 770,533 1,703,326	1,127,372 5,000,160 10,895,331 2,394,060 5,102,220	1,4,00	107,523 685,191 2,040,907 475,973 827,163	22,858 91,464 375,883 93,475 135,075	340,214 1,625,848 4,632,202 981,845 2,245,901	01 = 00010	649,621 3,316,429 8,891,836 1,960,808 4,080,237	1,683,731 2,003,495 433,252 1,021,983		66,046 220,000 565,653 125,028 265,489	1,450,778 1,408,952 306,876 751,004	72,505 203,865 662,901 -51,311
Grand 7 Great N Gulf & Gulf, Co	Frunk Western Vorthern Ship Island olorado & Santa Fe	347 308 308 352	4,171,102 50,631,214 1,368,306 8,387,602 5,243,763	1,994,782 13,930,960 361,639 2,750,687 840,071	6,555,785 69,329,993 1,848,634 11,879,473 6,544,209	11	1,213,709 9,112,284 370,143 1,907,817 1,370,983	243,864 1,246,098 32,301 287,131 99,270	3,107,155 19,547,366 520,992 4,715,325 2,223,466	200,562 1,310,737 94,977 364,311 161,180	5,545,737 42,282,313 1,267,055 9,175,818 4,482,114	1,010,048 27,047,680 581,579 2,703,655 2,062,095	-20,406 120,715 198	346,500 4,350,625 82,503 548,564 438,000	22,817,770 499,274 2,155,091 1,624,095	-682,169 -3,865,471 -114,331 -778,834 -464,531
Houston Houston Illinois Indiana Internat	n, East & West Texas. R Texas Ceutral. Central Harbor Belt.	191 789 763 105 105	886,783 3,992,142 40,427,991 6,594,562	368,729 1,661,485 12,613,496 2,070,073	1,328,826 6,079,000 60,632,156 2,992,660 9,286,670	215,728 1,011,956 8,460,257 401,832 1,494,559	142,183 885,086 13,291,383 369,567 1,125,781	20,734 157,038 1,189,107 31,970 295,941		45,456 202,761 1,485,052 86,130 366,262	976,730 5,105,163 46,731,539 2,320,559 7,437,717	352,096 973,837 13,900,617 672,101 1,848,953	13,924 24,959 17,594	56,096 321,290 3,010,000 69,541 314,842	296,000 650,670 10,876,693 627,519 1,516,517	20,033 -454,284 853,150 -188,769
Kanawh Kansas Lake El Lake Sh Lehigh	a & Michigan City Southern. rie & Western. hore & Michigan Southern. & Hudson River.	177 827 906 ,857 97	2,526,426 7,483,331 4,165,166 31,428,889 1,504,624	347,039 1,542,991 784,188 11,737,005 45,834	2,944,523 10,012,986 5,260,475 48,960,702 1,633,297	405,414 1,036,469 829,622 6,282,577 247,422	671,051 1,220,142 1,077,012 11,570,570 255,551	31,923 295,208 157,370 944,336 15,516	223	76,897 406,864 132,476 1,079,254 50,484	2,094,992 6,333,887 4,382,217 37,691,161 1,210,284	849,531 3,679,099 878,258 11,269,541 423,013	83,724	116,850 501,210 243,640 2,212,712 44,000	732,516 3,177,889 634,618 9,140,553 379,013	-201,568 -88,223 -457,290 -7,675,943 -134,399
Lehigh Lehigh Long Is Louisian	Lehigh & New England Lehigh Valley Long Island Lourisiana & Arkansas Louisiana Ry. & Navigation Co	293 398 274 351	1,893,220 30,447,367 3,095,315 1,279,198 1,425,713	12,914 4,374,304 6,995,235 248,578 266,313	1,981,389 36,161,936 11,268,107 1,577,439 1,806,323	4-	10	22,000 917,331 159,443 27,705 67,583	532,219 12,967,367 5,034,127 406,398 744,854	44,666 859,874 303,539 57,222 73,679	1,137,610 25,451,213 8,239,550 1,032,807 1,441,901	843,779 10,710,723 3,028,557 544,632 364,422	240,313	37,456 1,423,000 711,250 62,165 73,000	806,323 9,047,410 2,312,441 482,467 291,422	37,730 -2,224,032 -319,258 -57,841
Louisiana Louisville, Maine Ce	Louisiana Western Louisyille & Nashville Louisville, Henderson & St. Louis Maine Central	208 4,934 200 1,207	1,355,459 39,669,406 796,373 6,814,364	674,464 12,050,219 374,597 3,179,255	2,133,030 55,167,021 1,247,840 10,654,081	% -	452,329 11,275,372 163,093 1,665,397		684,354 19,026,321 433,382 4,162,364	73,209 1,151,404 35,037 315,927	1,524,872 41,280,042 933,607 7,774,670	608,158 13,886,979 314,233 2,879,411	-9,071 27,332 1,803 -44,194	112,951 1,801,359 39,600 545,908	486,136 12,112,952 276,436 2,289,309	—124,649 —228,399 129,174 —116,331
Michigan Midland Minneapol Minneapol	Michigan Central Midland Valley Minneapolis & St. Louis Minneapolis, St. Paul & Sault Ste. Marie	1,800 373 1,586 3,994	20,046,910 969,874 6,570,970 18,875,255	8,350,981 446,156 1,755,881 6,117,487	31,429,090 1,497,721 8,833,985 26,582,541	4,246,364 341,834 1,191,100 3,231,865	5,535,726 286,808 1,276,767 4,085,543	703,973 26,920 196,348 588,376	13,804,396 531,845 3,434,284 8,863,299	627,693 69,346 221,648 585,957	24,918,152 1,256,753 6,320,147 17,355,040	6,510,938 240,968 2,513,838 9,227,501	76,649 1,014 1,014 106,650	1,360,814 72,148 373,962 1,083,665	5,123,475 169,834 2,139,425 8,250,486	-3,225,717 $-19,467$ $-291,903$ $-2,855,141$

REVENUES AND EXPENSES OF RAILWAYS

ELEVEN MONTHS OF FISCAL YEAR ENDING JUNE 30, 1914-CONTINUED

Aver	Average mileage						Operating expense	expenses			Net				Increase
Name of road.	during	Oper	Operating revenues-	Total.	e e	Of	8	Trans-			revenue	operations,		Operating	comp. with
	Ď					equipment.	Traffic.	portation.	General.	,	(or deficit).	net.	Taxes.	(or loss).	last year.
Missouri & North Arkansas. Missouri, Kansas & Texas System Missouri, Oklahoma & Gulf Missouri, Oklahoma & Gulf Missouri, Pacific	3,821 3,821 19 19	\$735,309 18,798,010 825,532 106,587	\$385,689 8,390,821 229,384 5,766	\$1,196,180 29,209,161 1,098,331 114,220	\$305,720 4,310,910 250,867 14,615	\$229,504 3,577,905 183,538 16,434 4,569,239	\$40,692 675,833 58,930 2,076	\$483,810 11,402,488 538,075 60,397	\$62,587 1,120,994 76,762 8,868	\$1,122,313 21,088,130 1,108,172 102,390	\$73,867 8,121,031 	-\$97,718 4,195	\$60,500 1,388,105 67,847 2,195	\$13,367 6,635,208 -73,493 9,635	\$29,634 -1,236,228 -103,321 14,113
hela Connecting La. & Texas R. R. & Chattanooga & St. I.	1	1,279,731 2,941,495 8,132,576		1,331,208 889,345 4,353,891 11,805,680	163,766 93,405 581,874 1,824,515	76,390 158,408 670,640 2,242,706	4,582 3,300 133,461 468,491	277,601 438,897 1,805,160 4,501,524	23,922 29,901 142,150 354,363	546,261 723,911 3,333,285 9,391,599	784,947 165,434 1,020,606 2,414,081	15,661	25,100 29,250 265,650 294,980	759,847 136,184 739,295 2,109,406	244,770 -334,813
Nevada - Northern New Orleans & North Eastern New Orleans Great Northern New Orleans, Mobile & Chicago New Orleans, Texas & Mexico	204 283 403 286		135,855 590,889 358,769 339,583 200,184	1,619,334 3,656,098 1,723,285 2,037,471 1,470,515	194,137 383,076 230,338 300,488 461,542	216,477 793,543 201,324 247,394 149,213	1	377,546 1,379,579 492,986 653,365 590,842	142,609 82,691 87,938 101,626		844,551 687,187 705,597 128,529	-3,621 -852 -943	83,613 168,163 30,253 79,417 13,546	672,767 672,767 656,082 625,237 114,983	-18,713 -14,092 30,217 -8,194 -135,450
New York Central & Hudson River. New York, Chicago & St. Louis. New York, New Haven & Hartford. New York, Philadelphia & Worfolk. New York, Shiladelphia & Western. New York, Susunehanna & Western.	566 566 566 566 112		31,763,373 1 1,470,105 25,089,275 1,566,623 470,124 500,694	103,239,170 10,859,501 60,839,177 8,231,106 3,450,676	1,385,696 7,870,431 1,167,262 304,956	20,830,595 1,728,124 9,314,051 1,482,468 1,737,357		39,047,255 5,093,785 25,065,413 3,237,365 1,576,344 1,46,991	2,706,369 213,725 1,662,539 183,405 155,246 67,620		23,955,680 1,901,536 16,493,035 2,046,791 623,278 866,205	-267,935 -29,870 -25,923 -25,923		18,041,012 1,443,452 13,291,247 1,808,068 528,778 701,486	-4,923,349 -1,189,763 -3,220,282 -207,152
Norfolk & Western Norfolk Southern Northern Central Northern Pacific Northern Pacific	,036 842 472 ,313			40,756,465 3,650,796 12,087,236 62,887,165 3,382,264	4,537,068 559,326 1,567,468 8,215,183	8,436,089 521,732 2,739.155 7,683,649		12,949,340 1,339,284 6,002,861 20,538,119 1,239,320	1		13,256,847 971,904 1,287,631 24,344,555 957,851	-16,753 3,138 7,329 281,432		11,760,094 859,810 846,522 20,037,566	861,997 322,593 539,443 2,332,455 60,789
Oregon Short Line Oregon-Washington R. R. & Nav. Co. Pecos & Northern Texas. Pennsylvania Company Pennsylvania Railroad	,064 ,915 ,750 ,750		4,526,118 4,490,848 416,436 9,278,033 34,633,759	20,258,914 15,888,909 2,210,596 55,726,472 164,702,264	2,511,022 2,232,878 227,932 7,837,477 21,792,521	2,563,795 1,908,992 403,634 10,641,899 34,065,480		5,152,433 5,535,590 697,788 21,429,969 61,760,050	_	11,218,627 10,863,652 1,433,666 42,270,854 24,053,152	9,040,287 5,025,257 776,930 13,455,618	32,413 55,633 106,331		7,606,291 3,745,501 694,109 10,338,546 32,214,411	776,368 -588,370 26,944 -2,584,768
Philadelphia, Baltimore & Washington. Pittsburgh & Lake Erie. Pittsburgh, Cincinnati, Chic. & St. Louis. Pittsburgh, Shawmut & Northern. Richmond, Fredericksburg & Potomac.	717 2224 1,472 282 88		7,674,618 1,660,268 8,053,770 120,903 955,928	18,846,476 16,238,616 38,783,247 1,946,238 2,692,907	2,942,172 1,708,172 5,698,844 351,375 280,758	3,521,286 3,583,945 7,927,993 526,002 310,861		8,381,765 4,240,776 15,424,844 705,541 1,014,437		15,708,775 10,034,313 30,777,956 1,656,636 1,722,347	7,4,3		600,092 636,386 742,566 20,117 89,280	2,537,609 5,564,163 6,254,916 269,485 865,461	528,496 3,251,876 1,206,715 184,708 187,695
Rutland St. Joseph & Grand Island St. Louis, Brownsville & Mexico. St. Louis, Iron Mountain & Southern. St. Louis Merchants Bridge Terminal.	468 319 518 ,365	1,809,295 1,041.053 1,468,165 22,686,134		3,398,636 1,483,634 2,475,301 30,648,231 1,751,334	390,320 302,081 544,164 4,092,299 332,557	640,740 229,952 263,510 4,777,675 116,955	100,609 55,296 54,003 596,177 8,036	1,385,043 645,769 950,838 9,317,070 962,351	71,875 66,885 121,530 820,473 68,975	2,588,587 1,299,983 1,934,045 19,603,694 1,488,874	810,049 183,651 541,256 11,044,537 262,460		190,737 79,433 83,728 1,219.317 66,901	619,544 104,209 457,528 9,798,122 195,559	30,154 43,691 72,494 167,437
St. Louis, San Francisco & Texas. St. Louis Southwestern St. Louis Southwestern of Texas. San Pedro, Los Angeles & Salt Lake.	244 923 811 ,133	962,659 5,882,139 2,802,529 6,317,477 15,969,177		1,390,245 7,638,799 4,248,697 9,727,118	299,689 756,414 1,049,698 1,173,817 2,881,259	221,305 1,404,928 1,049,149 1,615,027 3,158,239	27,095 321,413 147,745 349,096 724,788	605,371 1,975,268 1,828,466 3,292,520 8,551,441		1,215,804 4,777,145 4,303,276 6,636,576 16,006,462	2,861,654 -54,579 3,090,542 7,338,008	-14,209 -2.763 -34,580 -16.773	16,892 357,548 196,762 479,583 912,000	2,489,897 2,489,897 254,104 2,576,399 6,409,235	-93,908 -686,138 -531,227 -80,795 168,615
Southern Kansas of Texas. Southern Rafice Co. Spokane International Spokane, Portland & Scattle.	,035 179 163 163 556			64,367,103 1,243,499 84,064,225 938,321 4,485,813	8,424,155 134,140 9,792,092 141,203 718,072	10,937,182 246,965 12,025,557 59,693 411,466	44884	23,018,956 390,610 24,267,767 281,208 1,124,968		46,422,622 829,505 50,347,054 545,656 2,486,438	17,944,481 413,994 33,717,171 392,665 1,999,375		2,454,533 42,042 4,802,034 38,618 587,400	15.537,786 371,952 29,883,841 354,047 1,409,034	-1,128,687 -133,620 -4,748,824 -48,923 -435,198
Tennessee Central Terminal R. R. Ass'n of St. Louis. Texas & New Orleans. Toledo & Ohio Central Toledo, Peoria & Western	294 458 444 248			1,567,679 2,600,295 3,834,808 5,111,243 1,189,549	297,232 433,247 701,471 927,527 234,814	184,867 208,651 875,540 1,078,235 300,944	63,259 10,206 94,241 88,918 27,602	552,170 1,030,397 1,638,510 2,072,734 539,273	80,310 62,564 145,943 117,630 40,438	1,177,838 1,745,065 3,455,705 4,285,044 1,143,071	389,841 855,230 379,103 826,199 46,478	87,592 7,609 5,957	46.717 308.708 210.822 232.979 67,600	343.124 634.114 175.890 587.263	-20,515 -194,829 -156,987 -544,947 -185,543
Trinity & Brazos Valley Union Pacific Union R. R. of Baltimore Union R. R. of Pennsylvania Vandalia	463 614 31 910	1,575,738 32,955,126 1,223,803 6,985,989		2,162,608 47,026,445 1,497,343 3,694,412 10,361,375	580,802 5,143,257 160,850 585,504 1,324,137	332,367 6,673,525 1,101,187 2,086,929	1,142,327 7,622 1,179 288,931	1,082,145 12,788,229 54,456 1,719,701 4,200,237	1,372,688 28,237 46,773 236,787	2,239,510 27,120,026 251,165 3,454.344 8,137,021	-76,902 19,906,419 1,246,178 240,068 2,224,354	49.440	61,267 2,073,991 65,981 93,500 349,573	-138.169 17,714,562 1,180.197 196.008 1,874,781	-376,981 $-1,560,830$ $-203,314$ $-907,732$ $-151,751$
Vicksburg, Shreveport & Pacific. Virginia & Southwestern Virginian Washington Southern	171 240 503 36	985,484 1,562,711 5,348,673 415,788		1,665,783 1,780,066 5,851,857 1,180,586	271,855 248,967 775,676 158,678	328,992 437,678 941,230 158,699	39,386 24,142 60,375 14,792	575,862 510,330 1,372,094 485,634	58.729 43,723 120,082 34,652	1.274,824 1.264,840 3,269,457 852,455	390,959 515,226 2,582,400 328,131	76.889	76,662 70,578 235,645 38,464	311,799 444,648 2,423,644 284,942	2,727 1,690 289,511 73,190
West Jersey & Seashore. Western Ry. of Alabama. Wheeling & Lake Erie. Yazoo & Mississippi Valley.	356 133 459 1,372	1,654,845 766,432 6,104,589 8,239,197	3,795,092 506,319 573,886 2,688,956	5,812,800 1,377,278 7,100,937 11,687,664	927.750 245.098 933.327 1,652,509	939,833 269,586 1,199,661 1,639,419	171.895 69,376 102,489 172,324	2.511.758 396,123 2,481,491 4,294,891	148,606 62,890 202,705 304,138	4,699.842 1,043.073 4,919.673 8,063.281	1,112,958 334,205 2,181,264 3,624,383	-37.383 -146 -933 $-1,702$	289,891 54.666 336,679 501,000	785,684 279,393 1,843,652 3,121,681	152,172 21,175 327,779 1,325,773

Season Passes for Employees' Wives

As a result of the safety records made by the Western and the Ozark divisions of the St. Louis & San Francisco, for the year ending May 31, one woman in every employee's family on these divisions will receive a pass good for six months over the division on which she is located. These pass prizes are also awarded to one woman in every employee's family at the St. Louis and the Memphis terminals, the winners being allowed, in this instance, to designate over which division they wish to have their passes extend. The idea of awarding passes for prizes originated with Mr. Nixon, the chief operating officer, and the incentive thus provided has resulted in a remarkable decrease in the number of casualties.

The pass prizes are awarded on two different plans: One, for the division making the greatest number of train miles per casualty; the other, for the division showing the best gain in this respect for the year ending May 31, as compared with the year ending May 31, 1913. The western division made a reduction of 46 per cent. from its record for the previous year, showing 9,146 train miles for each casualty, as compared with 5,588. The Ozark division-which has been a consistent prize winnershows 10,112 train miles per casualty, which is the best record of all the Frisco divisions; but, because of its being a prize winner the previous year, it does not show the large gain made by the western division.

The Memphis terminal-which has won the prize three times in succession-reports 790 switching hours per casualty, the best of all the terminals; but the St. Louis terminal shows the best gain this year over last—523 switching hours per casualty, as compared with 345. The basis of computation for the terminals on the road is the greatest number of switching hours made per casualty.

The receiver and chief operating officer awards a semi-annual pass to all female employees and to the female head of the family of all employees on the division and at the terminal making the best record on the basis indicated.

Chicago Commission to Study European Terminals

The Chicago Railway Terminal Commission, which was recently appointed by the city council committee on railway terminals, as provided for in the ordinance for the new Union station, to make a comprehensive study of the terminal problem in Chicago, and to make a special preliminary report on January 1, 1915, left Chicago on Wednesday of this week for a trip of several weeks to study the principal railway terminals of European cities, as well as several in this country. E. C. Carter, who recently resigned as chief engineer of the Chicago & North Western, has been retained by the presidents of the Chicago railways to accompany the commission, at its request that the railways be represented. The commission includes John F. Wallace, consulting engineer retained by the committee; Bion J. Arnold, engineer representing the Citizens' Terminal Committee; Walter L. Fisher, also representing the Citizens' Terminal Committee; E. H. Bennett, architect of the Chicago Plan Commission; and Alderman Geiger, chairman of the council committee on terminals. A number of aldermen will also accompany the committee. The commission will visit Toronto, Montreal, Boston and New York, sailing on the Lusitania on While abroad they will visit Liverpool, Manchester, London, Paris, Vienna, Buda Pesth, Berlin, Frankfort, Kiel, Copenhagen and Stockholm. They expect to return to Chicago in September.

International Railroad Master Blacksmiths' Association

The twenty-second annual convention of the International Railroad Master Blacksmiths' Association will be held on August 18, 19 and 20 at the Hotel Wisconsin, Milwaukee, Wis. The subjects to be considered at the meeting are: Flue Welding: Making and Repairing Frogs and Crossings; Car-bon and High Speed Steel; Tools and Formers; Electric Welding; Drop Forging; Spring Making and Repairing; Piece Work and Other Methods; Locomotive Frame Making and Repairing; Oxy-Acetylene Process for Cutting and Welding; Case Hardening; What New Subjects Can Be Brought Up to Benefit the Association; Heat Treatment of Metals; and Shop Kinks.

Society of Railway Financial Officers

The annual meeting of the Society of Railway Financial Officers for the year 1914 will be held at the Hotel Aspinwall, Lenox, Mass., from September 15 to 17, inclusive. Announcement of the business of the meeting will be made later.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 5-8, 1915, Hotel Sherman, Chicago.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, Washington.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, 143 Liberty St., New York. American Association of Freight Agents.—R. O. Wells, I. C. R. R., East St. Louis, Ill.

AMERICAN ASSOCIATION OF RAILBOAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Next convention, August 20 and 21, New York.

American Electric Railway Association.—E. B. Burritt, 29 W. 39
New York. Annual convention, October 12-16, Atlantic City, ICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION .- W. F. Allen, 75 Church St., New York. AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles,

Cal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 16-18, 1915.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Karpen Building, Chicago.

American Railway Tool Foremen's Association.—A. R. Davis, Central of Georgia, Macon, Ga. Next convention, July 20-22, Hotel Sherman,

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 30 to July 4, Hotel Traymore, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. W. Hunt, 220 West 57th St., New York; 1st and 3d Wed., except June, July and August, New York.

American Society of Engineering Contractors.—J. R. Wemlinger, 11
Broadway, New York; 2d Thursday of each month, at 2 P. M.,
11 Broadway, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 19-21, 1915, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, 1300 Pennsylvania Ave., Washington, D. C. Annual convention, April 28, 1915, Atlanta, Ga.

ASSOCIATION OF RAILWAY CLAIM AGENTS .- C. W. Egan, B. & O., Baltimore,

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Annual convention, October 19-23, Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew, 112
West Adams St., Chicago.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York.

Association of Water Line Accounting Officers.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Chicago, Ill. Meeting with American Railway Bridge and Building Association. Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que.; 1st Thursday, October, November, December, February, March and April, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawler Ave., Chicago; 2d Monday in month, except July and August, Lytton Bldg., Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Fri, in Jan., May, Sept. and Nov. and 2d Thurs. in March, Hotel Statler, Buffalo, N. Y.

Statler, Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—Edw. J. Dugan, P. O. Box 654, St. Paul, Minn.; 2d Monday, except June, July, August and September, Old State Capitol Bldg., St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—Edw. R. Dasher, Box 75, Harrisburg, Pa.: 1st Friday after 10th of each month, except July and August, 31 So. Front St., Harrisburg, Pa.

Engineers' Society of Western Pennsylvania.—Elmer K. Hiles, Oliver Bldg., Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION .- Warren P. Taylor, Richmond, Va. GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunto-Grand Central Station, Chicago; Wed. preceding 3d Thurs., portation Bldg., Chicago. Hunter, 600 Trans-

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

NATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick Bldg., Chicage.

International Railway General Foremen's Association.—Wm. Hall, 829
West Broadway, Winona, Minn. Next convention, July 14-17, Hotel
Sherman, Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, Lima, Ohio. Next convention, August 18-20, Hotel Wisconsin, Milwaukee, Wis.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next convention, November 17-19, 1914, Detroit, Mich.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR BUILDERS' ASSOCIATION .- J. W. Taylor, Karpen Building, Chi-

MASTER CAR & LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next convention, September 8-11, Nashville, Tenn.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Next convention, March 15 to 19, 1915,

ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

Boston.

New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

Niagara Frontier Car Men's Association.—E. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings monthly.

Peoria Association of Railroad Officers.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

Railroad Master Tinners, Coppersmiths & Pipeffitters' Association.—U. G. Thompson, C. & E. I., Danville, Ill.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh. RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

Rainsas City, Mo.

Railway Electrical Supply Manufacturers' Assoc.—J. Scribner, 1021
Monadnock Block, Chicago. Meetings with Asso. Ry. Elec. Engrs.

Railway Fire Protection Association.—C. B. Edwards, Mobile & Ohio,
Mobile, Ala. Annual meeting, October 6, Washington, D. C.

Railway Gardening Association.—J. S. Butterfield, Lee's Summit, Mo.;

Railway Signal Association.—C. C. Rosenberg, Bethlehem, Pa. Annual
meeting, Bluff Point, N. Y., September 22-24.

RAILWAY STOREKEEPERS' ASSOCIATION .- J. P. Murphy, Bex C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with M. C. B. and M. M. Associa-

tions.

RAILWAY TELEGRAPH & TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Assoc. of Ry. Teleg. Supts. RICHMOND RAILROAD CLUE.—F. O. Robinson, C. & O., Richmond, Va.; 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-10, 1914, Chicago. St. Louis RAILWAY CLUE.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis. SALT LAKE CITY TEANSPORTATION CLUE.—R. E. Rowland, Hotel Utah Bidg., Salt Lake City, Utah; 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association. Society of Railway Financial Officers.—Carl Nyquist, La Salle St. States.

Society of Railway Financial Officers.—Carl Nyquist, La Salle St. Station, Chicago.
Annual meeting, September 15-17, Hotel Aspinwall, Lenox, Mass.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. Ry., Atlanta, Ga. Next meeting, July 16, Chattanooga, Tenn. Southern & Southwestern Railway Club.—A. J. Merrill, Grant Bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., 10 A. M., Candler Bldg., Atlanta.

Toledo, Ohio; 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Association.

N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago. Traffic Club of New York.—C. A. Swope, 291 Broadway, New York; last Tuesday in month, except June, July and August, Waldorf-Astoria, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Erie R. R., Pittsburgh, Pa.; meetings bimonthly, Pittsburgh. Annual meeting, 2d Monday in June. Traffic Club of St. Louis.—A. F. Versen, Mercantile Library Building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago.

Transfortation Club of Buffalo.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

Transfortation Club of Detroit.—W. R. Hurley, Supt.'s office, L. S. & M. S., Detroit, Mich.; meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meetings, September 15-18, Hotel Sherman, Chicago.

Utah Society of Engineers.—Frank W. Moore, Newhouse Bldg., Salt Lake City, Utah; 3d Friday of each month, except July and August, Consolidated Music Hall, Salt Lake City, Utah; Chus.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Morday, except June, July and August, Winnipeg, Western Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Morday, except June, July and August, Winnipeg, Western Railway Club.—J. W. Taylor, 1112 Karpen Building, Chicago; 3d Tuesday of each month, except June, July and August, Karpen Building, Chicago.

Western Society of Engineers.—J. H. Warder, 1735 Monadnock Block, Chicago; regular meeting 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings.

Traffic News

The Illinois Central has begun a suit in Kentucky to test the legality of the recent law of that state reducing passenger fares from three cents a mile to 21/2 cents.

The Interstate Commerce Commission has tentatively approved the new code of weighing rules formulated by the American Railway Association and the National Industrial Traffic League.

The Southern Pacific, in accordance with a recent order of the Interstate Commerce Commission, has published both east and westbound freight rates through the Ogden gateway for traffic to points south of Portland, Ore. The westbound rates are already in effect and the eastbound rates become effective July 10.

Tariffs have been filed with the Interstate Commerce Commission, effective August 1, providing for storage charges at the railroad warehouses in Superior, Wis., and Duluth, Minn. The tariff provides a charge of 20 cents a ton between April 15 and December 1, the season of open navigation, and 50 cents a ton for the closed season, December 1 to April 15.

The General Managers' Association of Texas is urging the adoption of a new form of livestock contract, making the railroads responsible only for physical damage to livestock caused by derailments and collisions, and eliminating the market prices as factors in settlements between shippers and the railroads. Under this new form of contract the railroads would not be responsible for shrinkage en route.

The Denver & Salt Lake on June 29 put into effect new tariffs of local freight rates on its lines, making a considerable reduction in both class and commodity rates, in some cases amounting to as much as 50 per cent. For example, the first-class rate from Denver to Craig, the terminus of the line, was reduced from \$1.70 to \$1.09 per 100 lb. The rate on nails between the same points was reduced from 86 cents to 35 cents. It was announced that the reductions were made in order to develop the territory of the road. Nearly all commodities are affected by the reduction.

No more low price, one-way colonist tickets to the West and Northwest will be sold by the Southern Railway. announcement is in accordance with the policy of President Fairfax Harrison to do everything possible to discourage the movement of people from the South. For a number of years the Southern has endeavored to discourage the offering of low colonist rates from the South and has only sold them at points where it was felt necessary to meet competition. From this time on, however, no such rates will be offered by the Southern Railway; this regardless of any action that may be taken by other lines. The Southern will continue to offer homeseekers' rates into the South.

Traffic officers of the Union Pacific, the Southern Pacific, the Atchison, Topeka & Santa Fe, the Chicago, Milwaukee & St. Paul, the Northern Pacific and the Great Northern, have been in Washington during the past week conferring with the Interstate Commerce Commission concerning the changes to be made in transcontinental freight tariffs as a result of the confirmation of the commission's decision, of 1911, by the recent opinion of the Supreme Court. The commission's order expired by statutory limitation in 1913 and the question now is whether the same order shall be reissued. There have been changes in conditions which may be used to support a claim on the part of the roads that different bases should now be applied.

A. M. Mortensen, traffic manager of the Panama-Pacific International Exposition estimates that the visitors to the exposition will number 2,132,500. This includes from points in the United States east of the Rocky mountains, 1,000,000; west of the Rocky mountains, exclusive of California, 250,000; from Europe and Africa, 50,000. Mr. Mortensen thinks that the attractions of California outside of the exposition will largely offset the disadvantage of being situated so far from the centers of population. The city of San Francisco has voted a bond issue of \$3,500,000 for electric car lines to convey passengers between the center of the city and the exposition grounds, the existing lines being inadequate.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Examiner Brown held a hearing in Chicago on July 1 on the complaint of the National Association of Ice Cream Manufacturers against the express companies on account of the rates for express shipments of ice cream, which went into effect February 1, 1914, in connection with the general revision of express rates made by the Interstate Commerce Commission at that time. In the new rates ice cream was changed from first to second class at the request of the shippers, but the express companies provided a minimum of 49 cents for five gallons. The ice cream men want a 40-cent minimum, which prevails in some states. They also ask a reduction in the rates for returned empty cans from 15 cents to 10 cents for five-gallon sizes or under, and from 25 cents to 15 cents for sizes over five gallons.

Switching at Baltimore, Maryland

Opinion by Commissioner McChord:

The commission finds that the carriers have not justified proposed increases in the rates for the transportation of carload freight from the connection between the Northern Central Railway and the Western Maryland in Baltimore to and from certain points on the "block route" in that city. (30 I. C. C., 581.)

Rates on Flour and Grain Products Between Virginia Points

Page Milling Company et al v. Norfolk & Western. Opinion

by the commission:

The commission finds that the rates on flour and grain products in carloads from milling points on the Shenandoah division of the Norfolk & Western in Virginia and West Virginia to points on the Pocahontas division and Clinch Valley extension in Virginia and West Virginia are not unreasonable or discriminatory (30 I. C. C., 605).

Tanbark Rates to North Carolina Points

Hans Rees' Sons v. Southern Railway. Opinion by Commissioner Clements:

The commission finds that a rate of six cents per 100 lb. on tanbark from Delrio, Tenn., to Asheville, N. C., is not discriminatory. It is also held that the carriers have justified a proposed cancellation of the application of the North Carolina intrastate mileage scale of rates on tanbark from stations on the line of the defendants in South Carolina to North Carolina tanning points, and the placing of that commodity on the same rate basis as lumber and other forest products. (30 I. C. C., 585.)

Rates on Iron Ore from Points in New York State

Ontario Iron Ore Company v. New York Central & Hudson

River et al. Opinion by Commissioner Meyer:

The commission finds that the present rate of \$1.10 per gross ton on iron ore in carloads from Fruitland and Ontario, N. Y., to Emporium, Pa., and the present rate of \$1.60 per gross ton on the same traffic to Earlston, Saxton and Riddlesburg, Pa., are not unreasonable or unjustly prejudicial. The rate of \$1.60 per gross ton to Curtin, Milesburg and Bellefonte, Pa., however, is found unreasonable to the extent that it exceeds \$1.40. (30 I. C. C., 566.)

Passenger Fares on the Washington-Virginia Railway

Virginia Highlands Citizens' Association v. Washington-Virginia Railway. Opinion by Commissioner Harlan:

The commission finds that defendant's charge for 25-trip family tickets for use between its Washington terminal at Twelfth and D streets, northwest, and Addison and Virginia Highlands in Virginia is discriminatory as compared with the commutation fares to other points on the Mount Vernon division. It is also held that as defendant provides a 52-trip monthly commutation ticket between Washington and Alexandria, New Alexandria and

other points on the Mount Vernon division it should also provide a similar ticket for Addison and Virginia Highlands and that the rate on this ticket should not exceed \$3. The one way and round trip fares are not found unreasonable. (30 I. C. C., 593.)

Dunnage Allowances

Opinion by the commission:

The commission finds that the carriers in southwestern territory have justified a proposed cancellation of the allowance for actual weight of dunnage not in excess of 500 lb. used by shippers and furnished at their expense to protect freight in carloads shipped in box, stock or refrigerator cars. There can be no doubt that the primary and most important purpose of the dunnage used in varying forms by the shipping interests is to make the load safe for transportation and to obviate injury to the goods, the prevention of damage to the carriers' equipment being a minor consideration. Under these circumstances and in view of the fact that the substitution of dunnage for the more expensive boxes and crates and other packing material is of advantage to the shipper and reduces the gross weight upon which freight charges must be paid, it is held not inconsistent that the carriers should receive revenue for the total weight hauled. Following the findings in the case entitled In the Matter of the Suspension of Western Classification No. 51, the continuance of the allowance for shipments on open cars is upheld. (30 I C. C., 538.)

Richmond Switching Charges

Richmond Chamber of Commerce v. Seaboard Air Line et al.

Opinion by Commissioner McChord:

The Atlantic Coast Line, Seaboard Air Line and the Southern Railway, southern carriers serving Richmond, Va., have a rule whereby they have for some time absorbed connecting line switching charges on carload traffic at Richmond, Va., only when the carrier performing the transportation service was in competition for the traffic with the switching line. The Chesapeake & Ohio and the Richmond, Fredericksburg & Potomac which also serve the city, absorb connecting line switching on all carload traffic from and to other than local points on their respective The result in general is that the arrangements affecting the absorption of switching charges at Richmond are quite different as far as the various receivers and shippers of freight at that point are concerned. The commission finds, therefore, that the refusal of the defendants to absorb switching charges on some carload shipments at Richmond, while absorbing such charges on other carload shipments to and from that point is discrimination against the shippers who are required to pay such charges. It is also found that the refusal of the defendants to absorb switching charges on some carload shipments at Richmond, while absorbing such charges on like shipments at Norfolk is discrimination against Richmond on traffic transported to and from that point. The defendants are therefore required to desist from such discrimination in the future. A complaint with respect to unreasonable and discriminatory charges on trap, peddler and station-order cars, however, is not sustained. (30 I. C. C.,

Omaha Grain Rates

Omaha Grain Exchange v. Northern Pacific et al. Opinion

by Commissioner Daniels:

On grounds similar to those in the case of Omaha Grain Exchange v. C. B. & Q., it is held that the Northern Pacific and the Chicago, Burlington & Quincy should establish joint rates on grain in carload lots from points in Montana on the line of the Northern Pacific west of Billings to Omaha, South Omaha and Council Bluffs, which will not exceed the rates contemporaneously maintained from the same points of origin to Minneapolis via the Northern Pacific. The points west of Billings are substantially equi-distant from Minneapolis and Omaha and although the routes to the latter involve a two line haul, this is not an important consideration because the distances involved are so great. The commission finds that the essential disparity in the distance traversed over the Chicago, Milwaukee & St. Paul and between points of origin in Montana, North Dakota and South Dakota and Minneapolis on the one hand, and between these points of origin and Omaha on the other, warrants a difference in the rates. It is held, however, that the present difference of five cents in favor of Minneapolis is discriminatory and that except where at present equal rates apply as in the Judith Basin territory between Roundup, Hilger and Twodot, the Chicago, Milwaukee & St. Paul should establish to Omaha, South Omaha and Council Bluffs, a rate not to exceed by more than two cents per 100 lb., the rate contemporaneously charged from the points of origin involved to Minneapolis. (30 I. C. C., 572.)

Pig Iron Rates from the South

Sloss-Sheffield Steel & Iron Company et al. v. Louisville & Nashville et al. Opinion by Commissioner McChord:

Operators of blast furnaces in Alabama and Tennessee complain that the existing rates on pig iron from the south to Ohio river crossings, to points north and east thereto all rail, and to New England, all rail and rail and water, are unreasonable and discriminatory. The rates from Chattanooga, Tenn., are made certain differentials under Birmingham and as these differentials have not been questioned, the entire southern situation can be dealt with by considering only Birmingham, which district is representative of the Alabama operations. Louisville is representative of Ohio river crossings, as Chicago and Boston are illustrative of central freight association territory and the east respectively.

The commission finds that the rates from Birmingham to Louisville, St. Louis, Chicago and to Boston via water and rail are unreasonable and should not exceed the following per gross ton: to Louisville, \$2.65; to St. Louis, \$3.40; to Chicago, \$4.00, and to Boston, rail and water, \$4.25.

The present differentials between the southern furnaces are to be maintained, as is also the relation of rates now obtaining to the Ohio river, to points in central freight association territory, and to the east. No change will be ordered in the proportional rates to the Ohio river at this time for the reason that this would throw the entire reduction upon the southern lines. The proportional rates to and from the Ohio river should be so revised as to make the through rate to Chicago, for example, not in excess of \$4 per gross ton.

It is also held that the rates from the New England ports to interior New England points are unreasonable as applied to through traffic and it is prescribed that the rate from Birmingham to Springfield and Portland should not exceed \$5.25; and to Lowell, \$5, with like reductions in the rates to other interior New England points. No opinion is expressed as to the reasonableness of the present differentials between the all-rail and rail and water rates to New England, but this is not to be taken as justification for any increase in the differentials.

No reparation is awarded. (30 I. C. C., 597.)

STATE COMMISSIONS

The Illinois Public Utilities Commission has entered an order further suspending, until October 15, the proposed increase of one cent per 100 lb. in the rates on grain in Illinois.

The Texas railways on June 30 filed with the Texas Railroad Commission the new tariff increasing the rates from Dallas and Houston to points in East Texas to correspond with the interstate rates from Shreveport, La., to the same points, in accordance with the decision of the Interstate Commerce Commission which was recently sustained by the Supreme Court. The Texas commission has not yet indicated whether it would approve or make opposition to the new rates, although at a hearing the week before the commission suggested that the railroads make a compromise by raising the Texas rate somewhat and reducing the Shreveport rate somewhat.

PERSONNEL OF COMMISSIONS

E. L. Adams, hitherto assistant signal engineer of the Lake Shore & Michigan Southern, has been appointed senior signal engineer of the division of valuation of the Interstate Commerce Commission for the southern division (Chattanooga).

COURT NEWS

See mention of the New York, New Haven & Hartford dissolution suit in Financial News.

Railway Officers

Executive, Financial, Legal and Accounting

The office of F. A. Healy, secretary and treasurer of the Ohio Electric, has been removed from Cincinnati, Ohio, to Springfield.

B. Lancaster has been appointed auditor of disbursements of the Union Pacific, with headquarters at Omaha, Neb., in place of E. L. Fries, transferred.

W. Scott Hancock has been appointed assistant general attorney of the Missouri Pacific and the St. Louis, Iron Mountain & Southern, for lines in Missouri, with headquarters at St. Louis, succeeding James F. Green, promoted. Mr. Hancock has been assistant attorney in the vice-president's office.

Albert J. Stone, general manager of the Erie at New York, has been elected vice-president, in charge of the operating department, with headquarters at New York, effective July 15. A portrait of Mr. Stone and a sketch of his railway career were published in the *Railway Age Gazette* of December 26, 1913, page 1244.

James H. Hustis, president of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., has been elected president of the Boston & Maine, effective August 15, succeeding Morris McDonald, who resigned last February. A portrait of Mr. Hustis and a sketch of his career were published in the Railway Age Gazette of August 1, 1913, page 179.

Operating

A. H. Ehlers, superintendent of the Copper Range at Houghton, Mich., has been appointed general superintendent.

H. E. Allen has resigned as superintendent of the Trinity & Brazos Valley at Teague, Tex., to go to the St. Louis Southwestern.

E. A. Gould has resigned as assistant to the general manager of the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, and the office is abolished.

R. A Pierce, yardmaster of the Oregon Short Line at Ogden, Utah, has been appointed superintendent of the Ogden Union Railway & Depot Company.

C. P. Torrey, acting superintendent of transportation of the Hocking Valley, has been appointed superintendent of transportation, with headquarters at Columbus, Ohio.

C. R. Duncan, trainmaster of the Illinois Southern at Sparta, Ill., has been appointed superintendent, succeeding J. C. Collins, resigned to engage in other business, and L. V. Combs succeeds

Warren D. Shull, trainmaster of the Waynesburg & Washington at Waynesboro, Pa., has been appointed superintendent, succeeding C. E. Bower, who has been retired under the pension rules of the company.

H. R. Hanlin has been appointed general manager of the Dayton & Union, with office at Cincinnati, Ohio, succeeding E. A. Gould, resigned, and W. F. Stark, superintendent at Dayton, Ohio, having resigned, his former position has been abolished.

J. P. Houston, assistant superintendent of the Minneapolis & St. Louis at Fort Dodge, Iowa, has been appointed superintendent of the Eastern division, with office at Oskaloosa, succeeding R. S. Marshall, resigned, to accept service with another company.

T. H. Sears, division superintendent of the Atchison, Topeka & Santa Fe at Marceline, Mo., has been appointed general superintendent at Amarillo, Tex. R. H. Allison, trainmaster at Emporia, Kan., succeeds Mr. Sears, and C. L. Mason takes the place of Mr. Allison.

J. W. Mulhern, superintendent of the Chicago-Petoskey division of the Pere Marquette at Grand Rapids, Mich., has been appointed superintendent of the Northern division of the Chicago Great Western, with headquarters at St. Paul, Minn., succeeding W. B. Causey, resigned.

The statement in our issue of July 3, that C. W. Bearden, assistant superintendent at Bloomington, Ill., of the Chicago & Alton, had been appointed chief despatcher and that E. E. Sutton, chief despatcher, had been appointed assistant chief despatcher was an error. Both will remain in their former positions.

Otto Holstein, until recently superintendent of transportation of the Guayaquil & Quito Railway in Ecuador, and previously operating manager of the Central Railway of Peru, has been appointed superintendent of transportation of the San Antonio, Fredericksburg & Northern, with headquarters at Fredericksburg, Tex.

- J. E. Taussig, superintendent of transportation of the Texas & Pacific, has been appointed general superintendent, with head-quarters at Dallas, Tex., succeeding J. W. Everman, resigned to accept service with another company, and the former office is abolished. J. B. Chandler, car accountant, has been appointed superintendent of car service, with headquarters at Dallas, and the former position is abolished.
- J. H. Dyer, superintendent of the Tucson division of the Southern Pacific at Tucson, Ariz., has been appointed superintendent of the Sacramento division, with office at Sacramento, Cal., succeeding W. A. Whitney, resigned to accept service with another company. T. H. Williams, assistant superintendent of the Tucson division at Sacramento, succeeds Mr. Dyer, and J. T. Bell, trainmaster at Sacramento, succeeds Mr. Williams.
- J. B. Heafer, assistant general manager of the International & Great Northern, has been appointed superintendent of transportation, with headquarters at Houston, Tex., and the office of second assistant general manager is abolished. J. L. Burd, formerly assistant superintendent of the Gulf division, has been appointed superintendent of that division, with headquarters at Palestine, Tex., to succeed J. P. Burrus, who has been appointed superintendent of terminals at Houston, with jurisdiction over the Columbia branch.
- A. F. Brewer, superintendent of the Utah division of the Oregon Short Line, will have jurisdiction also over the Montana division, with headquarters at Pocatello, Idaho. C. E. Brooks, who has been acting superintendent of the latter division, has been appointed assistant superintendent of the Idaho division, with headquarters at Nampa, Idaho. H. J. Plumhoff, trainmaster at Pocatello, has been appointed assistant division superintendent at Pocatello, and M. A. Pond, trainmaster at Salt Lake City, has been appointed assistant division superintendent at that place.

Jasper N. Haines, whose appointment as superintendent of the Seneca division of the Lehigh Valley, with headquarters at Sayre, Pa., has been announced in these columns, was born on February 20, 1876, at Pleasant Dale, W. Va. He began railway work in 1892 as water boy and laborer on construction work and was then consecutively station clerk, yard clerk trainmaster's clerk and general manager's clerk on the Pittsburgh & Lake Erie at Pittsburgh, Pa.; the Cleveland Terminal & Valley and the Cleveland, Lorain & Wheeling, now a part of the Baltimore & Ohio, at Cleveland, Ohio. On August 8, 1898, he went to the Lehigh Valley and has been in the continuous service of that road ever since, first as stenographer in the superintendent's office of the Mahanoy & Hazleton division and then as chief clerk. He was transferred in July, 1903, in the same capacity to the office of the superintendent of the Wyoming division. In October, 1904, he was appointed clerk in the general manager's office and the following May became chief clerk to the general manager. He was promoted to inspector of transportation on November 18, 1907, and in August, 1909, was appointed trainmaster of the Auburn division. On January 1, 1910, he was promoted to assistant superintendent of the Buffalo division, which position he held at the time of his recent appointment as superintendent of the Seneca division of the same road, as above noted.

Dixon Fay Kirkland, whose appointment as general manager of the Georgia & Florida, with headquarters at Augusta, Ga., has already been announced in these columns, was born on June 1, 1866, in Lowndes county, Ga., and was educated in the common schools. He began railway work in 1883, as a laborer with a bridge gang of the Plant Investment Company, building the South Florida Railway. He was then consecutively work train conductor, locomotive fireman, and from the latter part of 1885 to 1887 telegraph operator at various points on the Savannah, Florida & Western, now a part of the Atlantic Coast Line. From 1887 to January of the following year he was copying

operator in the despatcher's office at Savanah, Ga., and then was appointed a despatcher on the same road. appointed despatcher on the Georgia Southern & Florida in September, 1889, remaining in that position until April, 1891, when he was appointed despatcher on the Plant system. From July, 1898, to September, 1900, he was trainmaster, and then to December, 1905, was division superintendent of the same system which is now operated by the Atlantic Coast Line. From July to December, 1906, he was superintendent of transportation of the Georgia, Florida & Alabama, and from May, 1907, to April, 1911, was chief clerk to the superintendent of transportation of the Central of Georgia, and then, until the following October, was acting superintendent at Savannah, Ga. He was then trainmaster on the same road at Cedarstown, Ga., until January, 1912, when he became superintendent of the Georgia & Florida, and from April 15, 1913, to June 1, 1914, he was superintendent of the Atlanta, Birmingham & Atlantic, at Manchester, Ga., which position he held at the time of his recent appointment as general manager of the Georgia & Florida, as above noted.

Traffic

J. H. Barr has been appointed traveling freight agent of the Central of Georgia, with headquarters at Kansas City, Mo.

George A. Clifford, city passenger agent of the Canadian Pacific and the Minneapolis, St. Paul & Sault Ste. Marie at Cleveland, Ohio, has been appointed general agent at the same place.

- D. J. Bill, commercial agent of the Lake Erie & Western at Buffalo, N. Y., has been transferred to New York City as general agent. E. J. Lewis is appointed commercial agent at Minneapolis, Minn.
- G. C. Henderson has been appointed westbound agent, with headquarters at Kansas City, Mo., of the Central-Savannah Line, which is operated jointly by the Ocean Steamship Company and the Central of Georgia.
- R. W. Wirt has been appointed traveling freight agent of the Cincinnati, New Orleans & Texas Pacific and the Alabama Great Southern, with headquarters at Chattanooga, Tenn., succeeding E. L. Hunt, transferred.
- E. J. Pope has been appointed commercial agent of the Missouri, Kansas & Texas and the Wichita Falls & Northwestern at Wichita Falls, Tex., to succeed O. C. Thomas, who has been transferred to Oklahoma City, Okla., in a similar capacity.
- W. T. Stevenson, chief of the tariff bureau of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio, has been appointed assistant general freight agent, with office at Cincinnati. Walter Nichols, division freight agent at St. Louis, Mo., succeeds Mr. Stevenson, and S. A. Townsend, commercial agent at Pittsburgh, Pa., takes the place of Mr. Nichols. W. F. Greaves, general agent at Nashville, Tenn., has been appointed general southern freight agent, a newly-created position, with headquarters at Birmingham, Ala. Brent Arnold, Jr., general agent of the Western Maryland at Cleveland, Ohio, has been appointed general agent of the Big Four at Cincinnati, succeeding C. H. King, transferred to Louisville, Ky., as traveling freight agent. The following are appointed commercial agents: J. A. Moore, Nashville, Tenn.; C. W. Smith, Dallas, Tex.; J. M. Breen, Pittsburgh; A. F. Meyer, Kansas City, Mo.; M. T. Yeaton, Minneapolis, Minn.; M. R. Markle, Milwaukee, Wis., and J. J. Fahey, Memphis, Tenn.

Engineering and Rolling Stock

- F. C. Baluss has been appointed engineer of bridges and buildings of the Duluth, Missabe & Northern at Duluth, Minn.
- G. H. Wion, assistant supervisor of signals of the Pennsylvania Railroad at New York, has been appointed assistant signal engineer of the Victorian Government Railways, with headquarters at Melbourne, Australia.
- J. Hainen, superintendent of motive power of the Southern Railway at Washington, D. C., has been promoted to general superintendent of motive power and equipment, with head-quarters at Washington, succeeding A. Stewart, deceased, and E. C. Sasser, master mechanic at Spencer, N. C., has been promoted to superintendent of motive power of the Northern and Eastern districts, with headquarters at Washington, succeeding Mr. Hainen.

Purchasing

A. A. Dawley has been appointed purchasing agent of the Denver & Salt Lake, with headquarters at Denver, Colo.

Ray F. Transue has been appointed storekeeper of the Lehigh & New England, with office at Pen Argyle, Pa., succeeding F. B. Arndt, resigned.

G. E. Scott, acting purchasing agent of the Missouri, Kansas & Texas, has been appointed purchasing agent, with headquarters at St. Louis Mo.

George L. Mayer has been appointed purchasing agent of the Ohio Electric, with headquarters at Springfield, Ohio, succeeding Claude Burckmyer.

G. W. Saul, assistant purchasing agent of the Oregon-Washington Railroad & Navigation Company, has been appointed purchasing agent, with headquarters at Portland, Ore., succeeding R. Koehler, retired.

The office of J. F. Hoyer, purchasing agent of the New Orleans Great Northern, was abolished on July 1, and the purchasing of supplies is now handled through the office of R. H. Howard, general manager, at Jackson, Miss.

Ernest Baxter, whose appointment as purchasing agent of the St. Louis Southwestern, with headquarters at St. Louis, Mo., has already been announced in these columns, was born October

E. Baxter

11, 1882, at Delmer, Ont. He received a public and high school education, and began railway work in March, 1903, as messenger in the local freight office of the Michigan Central. From May to September he was with the Algoma Central & Hudson Bay as a clerk at Sault Ste. Marie, Ont., and from October, 1903, to March, 1905, he was secretary to the superintendent of the Grand Trunk at London, Ont. Mr. Baxter was then employed successively in the operating departments of the Cincinnati, Hamilton & Dayton at Indianapolis, Ind., and the Missouri Pacific at St. Louis, Mo.,

until February, 1906, when he became secretary to the general manager of the St. Louis Southwestern at St. Louis. In May, 1909, he was made chief clerk to the president of the latter road, from which position he was promoted to that of purchasing agent on June 22, as above noted.

OBITUARY

Guy Phillips, assistant secretary of the Missouri Pacific, and secretary and treasurer of the Richmond & Chesapeake Bay Railway, committed suicide by shooting himself at his office in New York on July 2.

Milton B. Van Zandt, treasurer and assistant secretary of the Chicago & North Western at New York, died on July 6 at his home in that city from a stroke of paralysis at the age of 66. He became general transfer clerk of the Chicago & North Western in February, 1872. He was promoted to be assistant treasurer in April, 1906, and was appointed treasurer of the same road on February 11, 1911.

Martin L. Clardy, vice-president and general solicitor of the Missouri Pacific-Iron Mountain system, with headquarters at St. Louis, Mo., died suddenly on July 5 in that city at the age of 68. He was born in St. Genevieve, Mo., and became connected with the Missouri Pacific in its legal department as assistant and later was general attorney of that road for Missouri and Illinois. In 1909 he succeeded Alexander G. Cochrane as general solicitor.

Equipment and Supplies

LOCOMOTIVE BUILDING

The Erie has ordered 5 Pacific type locomotives from the Baldwin Locomotive Works.

THE INTERCOLONIAL RAILWAY OF CANADA has ordered 3 switching locomotives from the Montreal Locomotive Works.

The Philadelphia Slag Company, Bethlehem, Pa., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

CAR BUILDING

THE WABASH is in the market for 7 postal cars.

THE MISSOURI PACIFIC is in the market for 25 caboose cars.

The Chicago Great Western is in the market for 500 40-ton box cars.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 400 box cars from the American Car & Foundry Company, and 250 box and 200 automobile cars from the Western Steel Car & Foundry Company. The Lackawanna is also in the market for 500 gondola cars in addition to those previously ordered.

IRON AND STEEL

THE ILLINOIS TRACTION SYSTEM has ordered 498 tons of material for its terminal building, at Peoria, Ill., from the Decatur Bridge Company.

CHINESE TRADITION VERSUS THE NEED OF PROGRESS.—The railways of China in 1913 carried over 20,000,000 passengers and 16,000,000 tons of freight. Another striking thing showing the new appreciation of western methods and a change which struck at the very root of all that the Chinese held in the deepest respect and reverence, was the yielding to the necessity for the occasional removal of graves in order that a railway might be properly constructed. The aversion to such removal in the early days of railway construction in China very often resulted in giving the lines some of the most extraordinary alinements.

PORTUGUESE RAILWAY DEVELOPMENT.—It is reported that during the past few years the personnel of the state and privatelyowned railways in Portugal have been showing better results. Notwithstanding restricted funds, improvements have been introduced in the technical and administrative departments and the structures and rolling-stock have been maintained in better condition. Hitherto the resources of the country have not been developed to full advantage. This is particularly noticeable in view of the headway the colonies are making as compared with the motherland. The development scheme proposed some time ago for carrying out railway extension, purchasing rolling-stock, etc., is now to be realized by the passing of an act dated April 13, 1913, which authorizes the government to raise nearly \$5,000,000. With this more rolling-stock is to be installed, and among other things the line from Vidago to connect with the Spanish frontier at Verin is to be commenced at once. Extensions on the Minho-Douro line are also to be carried out. Some idea of the slow progress of railway construction in the republic, which is about seven-tenths the size of England, may be gathered from the fact that in 1877 the total system stood at 596 miles, and 37 years after the total mileage reached only 1,793 miles. Since 1906 the increase has been only 13 miles. For many years the work of extension was at a standstill and the structures and rolling-stock allowed to deteriorate. Expansion of trade and traffic in Portugal, as in Spain, is seriously handicapped by the original layout of the lines, which do not provide the fruit and other agricultural industries with sufficiently cheap and rapid transit to the ports. The break of gage, which isolates the peninsula from France and the rest of Europe, is another disadvantage.

Supply Trade News

G. K. MacEdward, advertising manager of the Detroit Lubricator Company, has resigned to join the advertising department of the Chalmers Motor Company.

The American Mason Safety Tread Company, Lowell, Mass, has received an orde for over eighty tons of its "Karbolith" sanitary fireproof car flooring for the new steel cars of the Southern Railway which are being built by the Pressed Steel Car Company

Harry C. Holloway, who was for several years representative of the Rail Joint Company, New York, resigned on July 1 and opened an office in the Railway Exchange, Chicago. He will handle railway supply accounts, representing among other companies the Keystone Grinder & Manufacturing Company, of Pittsburgh.

On June 19, the United States patent office issued to William R. McKeen, president of the McKeen Motor Car Company, Omaha, Neb., patent No. 352,725, covering all-steel box cars, including underframe, superstructure, the steel box, the steel bracing and the diagonal bracing. This patent has been in litigation since 1906 in two interference cases which have been passed on by the examiners in chief, the commissioner of patents and the court of appeals of the District of Columbia, sustaining practically every claim made by Mr. McKeen. The Union Pacific steel box cars built in 1906 and 1907 were built under this patent.

TRADE PUBLICATIONS

STEEL TAPED CABLE.—The Simplex Wire & Cable Company, Boston, Mass., has recently issued a catalog descriptive of Simplex steel taped cable for city lighting and other circuits.

CONCRETE TIES.—The Percival Concrete Tie & Socket Company, New Orleans, La., has issued a pamphlet describing and illustrating the use and qualities of its reinforced concrete ties.

Belt Railway of Chicago.—This company has issued an attractive folder describing its service in the Chicago switching district and the plan of operation of the new clearing yards now under construction.

CAR HEATING VALVES.—The Gold Car Heating & Lighting Company, New York, has recently issued bulletins Nos. 938 and 940, illustrative of Gold's Packless twin and quick opening supply valves, respectively.

INTERPHONES AND ACCESSORIES.—The Western Electric Company has recently issued a catalog descriptive of its line of interphones and accessories. The booklet contains illustrations and descriptions of the apparatus, the information concerning it being given in clear and concise form.

MILLING MACHINES.—The Newton Machine Tool Works, Philadelphia, Pa., has recently issued catalog No. 48, descriptive of its line of horizontal milling machines. The booklet contains views of the various machines, specifications and brief descriptions of them and their accessories.

DITCHERS, PILE DRIVERS AND BUCKETS.—The Browning Company, Cleveland, Ohio, has recently issued folders devoted to the description and illustrations of its newly designed Browning ditchers, pile drivers and buckets. The illustrations clearly show the various conditions under which these devices work satisfactorily.

Jacks.—The Duff Manufacturing Company, Pittsburgh, Pa., has recently issued a very complete catalog of its various types of jacks. The catalog contains views of the jacks, specifications and statements naming the kind of work for which each is best adapted. Among the jacks included are Barrett trip or track jacks, Barrett automatic lowering jacks, Barrett automobile jacks, Duff ball bearing screw jacks, and Duff-Bethlehem hydraulic jacks. There are also sections on Dunn trench braces, jacks for special purposes and repair parts.

Railway Construction

Alabama Great Southern.—This company will start work at once on improvements at Tuscaloosa, Ala., putting in a new passing track north of the station and extending the switching lead. At Akron the track serving the station will be extended 200 ft. north and 2.417 ft. south. The passing track will be extended 1,403 ft. north and two storage tracks of 1,700 ft. and 1,518 ft. will be constructed, also 600 ft. of cinder pit track and a depressed track 400 ft. long.

BALSAM LAKE & EASTERN.—Incorporated in Wisconsin with \$100,000 capital to build from Balsam Lake, Wis., west to Centuria, about 8 miles. The incorporators include W. R. Taylor, J. W. Park and H. W. Radcliffe.

BAY CITY, LYNN HAVEN & NORTHERN.—Capitalists of New York and Philadelphia are planning to build a railway between Montgomery, Ala., and St. Andrews Bay, Fla., about 160 miles. It is proposed to secure control of the Birmingham, Columbus & St. Andrews Bay, operating a line from Chipley, Fla., south to Southport, 38 miles, which is to form part of the through route. The first work to be carried out will be on the section from Chipley, Fla., north to Hartford, Ala., about 28 miles, from which point the projected route is via Enterprise and Troy to Montgomery. The plans call for the construction of terminals at Southport, Fla., to include docks, wharves and warehouses. The Montgomery Chamber of Commerce may be addressed.

Berks & Lancaster (Electric).—Incorporated in Pennsylvania to build from Lititz, Pa., north to Womelsdork, about 18 miles. The incorporators include F. J. Duckett, W. Grimshaw, T. H. Paist and H. B. Longbottom, Philadelphia, and V. J. McGlesney, Phoenixville.

CHICAGO, BURLINGTON & QUINCY.—An officer writes that a contract has been let to Petersen & Company, Omaha, Neb., to build a cut-off from Yutan, Neb., southeast to Chalco. There will be a 300-ft. trestle on the line over Elkhorn river and a 1,700-ft. trestle over the Platte river.

The grading for the extension of this line from Casper, Wyo., to Orin Junction has been completed and the track is now being laid. This company is also building a new line connecting Wendover, Wyo., and Guernsey. The grading work is now being done by Kilpatrick Bros. & Collins Construction Company, Beatrice, Neb.

ILLINOIS CENTRAL.—This company has awarded a contract to the J. O. Heyworth Construction Company, Chicago, for two concrete subways at One Hundred and Fifteenth street and Kensington avenue, Chicago.

INTERMOUNTAIN RAILWAY.—An officer writes that contracts have been given to the Wasatch Grading Company and the Oregon Bridge & Construction Company for building from Boise, Idaho, east to Moores creek and Boise basin. Most of the work on the line will be canyon rock work, and the maximum grades will be 1 per cent. There will be one steel bridge with four 80-ft. girder spans and three 70-ft. girder bridges. The company expects to develop a traffic in lumber, logs, live stock, minerals and merchandise. C. A. Barton, president; C. N. Jacquette, chief engineer, and E. M. Hoover, treasurer, Boise, Idaho

KEWANEE, BRADFORD & HENRY INTERURBAN.—Plans are being made, it is said, to build an electric line from Kewanee, Ill., southeast via Osceola and Bradford to Henry, about 35 miles. C. G. Lampton, Cedar Rapids, Iowa, is interested. (See Illinois Roads, May 22, p. 1171.)

LEWISBURG & NORTHERN.—See Louisville & Nashville.

Louisville & Nashville.—An officer writes that a section of the Lewisburg & Northern between Brentwood, Tenn., and Athens, Ala., will be opened for freight traffic on July 15. The company does not intend to operate passenger trains over the line for some months or until the track and roadbed are in first class condition.

OGDEN RAPID TRANSIT COMPANY.—A contract is reported let to the Utah Construction Company, Ogden, Utah, to build a branch line east to Huntsville.

PACIFIC GREAT EASTERN.—This company, which is building a line from Vancouver, B. C., north to Prince George on the main line of the Grand Trunk Pacific, 480 miles, is now operating about 5 miles between North Vancouver ferry landing and West Vancouver and expects soon to open for traffic an additional section of 8 miles to Horseshoe Bay. The line is also open for traffic between Squamish at the head of Howe Sound and Cheakamus, 11 miles. Track laying is now being extended north from the latter section and grading work between the end of track and Lillooet, where the line crosses the Fraser river, 100 miles north of Vancouver, is finished. The unfinished bridges on this section will delay the completion of the track laying into Lillooet until next fall. The remaining section between Lillooet and Prince George is all under contract. The company expects that a force of about 6,000 men will be put to work on this section, and that the grading work will be finished to Prince George by the end of this year. (May 8, p. 1055.)

PENNSYLVANIA RAILROAD.—An officer writes that the elimination of grade crossings and track elevation work is being carried out through Wilkinsburg, Pa., from a point near Edgewood station through the boroughs of Edgewood, Wilkinsburg and the city of Pittsburgh to a point near the junction with the Brilliant branch, a total of about 2.25 miles. The maximum elevation of tracks above the present grade will be about 16 ft. The streets in Wilkinsburg are to be depressed about 51/2 ft. below the present grade, and the grade crossings eliminated at the intersection of Penn avenue and Pitt street, at South avenue and Hay street, and at Wood street and Rebecca avenue, where undergrade bridges are to be constructed. In addition a 10-ft. pedestrian tunnel will be constructed on the line of Franklin avenue and an 8-ft. pedestrian tunnel on the line of Whitney avenue. The work of eliminating two grade crossings in Pittsburgh at Homewood avenue and Brushton avenue has already been completed. The plans for the new elevated line provide for the eventual construction and operation of a seven-track railroad, although only five tracks will be laid at the present time; also for the construction of a new station in the vicinity of South avenue and Hay street, with island platforms between tracks, and a passenger and baggage tunnel under the tracks with elevators and stairways leading to the platforms. The improvements also include the construction of a modern freight station and delivery yard on the south side of the tracks on the north side of Penn avenue. The masonry work is being done by the Dravo Construction Company, Pittsburgh, Pa., and the track raising by the Pennsylvania Railroad forces. (See Pennsylvania Roads, May 29, p. 1215.)

St. John & Quebec.—An officer of this company, which is building a line from Grand Falls, N. B., southeast following the St. John river to St. John, about 210 miles, writes that track laying has been finished on 110 miles. Contracts have been let to Kennedy & McDonald, Woodstock; the Hibbard Company, Ltd., and the Corbett Company, Inc., both of Fredericton. The work includes building 14 steel bridges. On completion the line is to be operated by the Intercolonial Railway. A. R. Gould, president, Presque Isle, Me., and S. B. Wass, secretary, Fredericton, N. B. (September 26, p. 586.)

Southern Railway.—An officer writes that contracts for the construction of 19 miles of double track on the Washington division between Amherst, Va., and Elma have been let. C. W. Lane & Company, Atlanta, Ga., has been given the contract for eight miles from Amherst to Tye river and H. J. Dunavant, Chattanooga, Tenn., has been given the contract for 11 miles between Tye river and Elma. (July 3, p. 40.)

Texas Roads (Electric).—It is understood that plans are under consideration for the construction of an electric railway from Mexia, Tex., northwest to Fort Worth, about 95 miles. E. N. Farris, Hillsboro, Tex., may be addressed.

TRI-STATE RAILWAY COMPANY OF MICHIGAN.—A contract is reported let to A. C. Lingebach & Company, Chicago, to build the 18-mile section from Hillsdale, Mich., south to Pioneer, Ohio. This is part of the projected line from Adrian, Mich., to Elkhart, Ind. (June 19, p. 1565.)

VICKSBURG, ALEXANDRIA & SOUTHERN.—A contract is reported let to Frank T. Constant, Alexandria, La., to build a section of

8.5 miles from Tioga, La., to Alexandria. The company was recently organized, with headquarters at Alexandria, to build a line across the State of Louisiana. John F. Shepley, of the Union Trust Company, St. Louis, Mo., is president. (June 26, p. 1607.)

WISCONSIN SOUTHERN (Electric).—Bids are being received, it is said, to build 32 miles of railway in the state of Wisconsin. The company was organized to build from Madison, Wis., northeast via Sun Prairie, Columbus, Beaver Dam, Juneau, Horicon, Mayville, Knowles, Lomira, Campbellsport, and Dundee to Plymouth; also from Knowles north via Brownsville and Oakfield to Fond du Lac. C. D. Smith, president and general manager, Fond du Lac, Wis.

RAILWAY STRUCTURES

CHARLESTON, S. C.—An officer of the Holston Corporation organized to carry out the work on new terminals for the Carolina, Clinchfield & Ohio writes that the contract for the dredging for Charleston terminals has been let to the Atlantic Gulf & Pacific Co., New York. The contract for the concrete dock and foundations has been let to McArthur Brothers, New York. (July 3, p. 40.)

CHARLESTOWN, W. VA.—An officer of the Norfolk & Western writes that a contract has been given to Wade & Graham, Roanoke, Va., for building a brick passenger station 27 ft. x 107 ft. 3 in. and a brick freight house 27 ft. x 100 ft. at Charlestown. The estimated cost of the improvement is about \$25,000.

CLINTON, IOWA.—The Chicago & Northwestern is contemplating building a 180-car capacity repair yard at Clinton, Iowa. There will be a total of four buildings, one brick veneer mill building, 60 x 150 ft., one brick veneer shop building, 50 x 100 ft., one frame store building, 22 x 150 ft., and one frame lumber shed 22 x 100 ft. The contract for this work will be let in the next few days. The estimated cost is about \$80,000.

FLORENCE, S. C.—A contract is reported let to D. J. Rose, Rocky Mount, N. C., for improvements at Florence, to include a roundhouse, a turntable, planing mill and machine shop for the Atlantic Coast Line.

Jackson, Tenn.—An officer of the Mobile & Ohio writes regarding the report that the company will put up new shops at the Claymore yard and will make repairs to the existing shops at Jackson, that no definite plans have been prepared for these improvements.

Metropolis, Ill.—The Paducah & Illinois Railway, a subsidiary of the Chicago, Burlington & Quincy, and the Nashville, Chattanooga & St. Louis, has let a contract for seven pneumatic piers for a double track bridge over the Ohio river at Metropolis, Ill., to the Union Bridge & Construction Company, Kansas City. These piers will be sunk about 90 ft. and will require about 84,000 yd. of concrete. The entire structure will be 5,650 ft. long, and will include one 722 ft., four 555 ft. and one 304 ft. spans. The estimated cost of the structure is \$3,500,000, while the amount involved in this contract is \$1,100,000. C. H. Cartlidge, of Chicago, is chief engineer.

New YORK.—The New York Public Service Commission, First district, will open bids on July 23 for the finish work in six stations on the extension of the Fourth avenue subway in the borough of Brooklyn between Fortieth and Ninetieth streets.

The Spanish Lines of the Paris, Lyons & Mediterranean has acquired the railways owned by the North-Eastern Company of Spain, a small company operating two or three subsidiary lines in the Barcelona district. The railways thus transferred are those running between Barcelona to Manresa, via Martorell, the Central Catalonia (from Martorell to Igualada) and the Manresa-Berga-Guardiola. Work has been re-started on the extension of the Martorell line to Manresa, and it is expected that this will be opened this summer as far as Olesa de Montserrat. Subsequently the continuation of the Manresa-Berga line will be undertaken with the object of linking up this to the Paris, Lyons & Mediterranean main system at the frontier via Puigcerdá.

Railway Financial News

ALTUS, LUBBOCK & ROSWELL.—This road, which runs from Altus, Tex., to Wellington, 60 miles, has been sold by E. Kennedy to J. M. West, E. C. Noble and Carey Shaw, of Houston, Tex., and O. L. Slayden and F. E. Wheeler, of Lubbock, Tex.

BALTIMORE & OHIO.—This company, through the Moorefield & Virginia, has taken over the Hampshire Southern, which runs from Romney, W. Va., to Petersburg.

Boston & Maine.—See New York, New Haven & Hartford.

CHICAGO GREAT WESTERN.—This company has made arrangements with the Minneapolis, St. Paul, Rochester & Dubuque Electric for this road to take over the Great Western's passenger business between Randolph, Minn., and Mankato.

CINCINNATI, HAMILTON & DAYTON.-Judson Harmon, formerly governor of Ohio and a receiver of the company when it was previously in the hands of a receiver, and Rufus B. Smith, have been appointed receivers of the Cincinnati, Hamilton &

HAMPSHIRE SOUTHERN.—See Baltimore & Ohio

KANSAS CITY, MEXICO & ORIENT .-- On July 6 the property was sold under foreclosure to the reorganization committee for \$6,100,000, the upset price.

The reorganization committee has also bought the assets of the Union Construction Company, the International Construction Company of Delaware and the International Construction Company of Texas.

LAKE ERIE & NORTHERN.—See Canadian Pacific.

MISSOURI PACIFIC.-Representative Barton, of Nebraska, claiming that the Missouri Pacific owes the United States Government \$4,000,000 on account of subsidiary bonds sold about 30 years ago and the proceeds loaned to this company. It is claimed that \$1,600,000 bonds were authorized, the company having the proceeds of the sale and agreeing to pay back the government in full and until this debt was paid to carry the mail free on the 100-mile line which was in part built with the proceeds. The secretary of the treasury has been called upon

NEW ORLEANS, TEXAS & MEXICO.—Equipment trust certificates, amounting to \$800,000 and to be issued to reimburse the company in part for equipment costing \$1,000,000 bought by the receivers, are to be offered to the public within a few days.

NEW YORK, NEW HAVEN & HARTFORD.—The Massachusetts legislature passed a bill amending the charter of the Boston Railroad Holding Company permitting the sale by the New Haven of the Boston & Maine, with the proviso that each certificate of stock should be stamped with an agreement under which the purchaser must, at the option of the state of Massachusetts, sell this stock to the state. The New Haven refusing to sell its Boston & Maine stock under these conditions, Attorney General McReynolds has announced that he intends to proceed with a suit for dissolution of the New Haven.

NEW YORK, ONTARIO & WESTERN.-No dividend was declared on the common stock at the regular annual meeting. In 1913 2 per cent. was declared; in 1912, none, and in 1906 to 1911 inclusive, 2 per cent.

NORTHERN PACIFIC.-J. P. Morgan & Co., the First National Bank and the National City Bank, all of New York, have bought from the company and are offering to the public \$20,000,000 of the new refunding and improvement mortgage 4½ per cent. bonds, series A, of July 1, 1914-2047. The offering price to the public is 97, yielding 4.64 per cent. interest on the investment. The bonds are redeemable at 110 after July The mortgage securing them is a first lien on 847 miles of road and a junior lien on the balance of the 6,271 miles covered by the mortgage. The balance of the bonds under this mortgage may be issued for refunding prior debt and for a face amount equal to the cost of additional property and betterments. After a specified amount, however, is outstanding the bonds may be issued for additional property and betterments only to the extent of 80 per cent. of the cost thereof.

PEORIA & EASTERN.-John F. Wallace, chairman of Westinghouse Church Kerr & Co.; Lewis E. Waring, of Edward Sweet & Co.; Sydney S. Schuyler, of Schuyler, Chadwick & Burnham, and Thomas Nelson have formed a committee and are asking the deposit on or before September 1 of the income mortgage 4 per cent. bonds.

St. Louis & San Francisco.-Judge Sanborn has ordered the consolidation of the Bankers Trust Company suit against the St. Louis & San Francisco receivers with the general receivership proceedings.

SAN ANTONIO, UVALDE & GULF.—This company has asked the Texas railroad commission to register \$1,024,000 bonds to be issued on 43 miles of road recently completed.

SOUTHERN RAILWAY .- Voting trust certificates representing the common and preferred stock, which were issued in 1894 and extended in 1902, are called in for July 31, and stock certificates are to be exchanged for them.

DELAWARE & HUDSON

BALANCE SHEET.

	Assets.		_
Items.	1913.	1912.	Increase or Decrease.
Unmined Coal Owned and			
Controlled	\$15,943,915.00	\$16,397,240.93	
Advances on Unmined Coal	354,279.51	354,033.35	246.16
Real Estate	805,713.50	805,850.47	-136.97
Road and Equipment-The D.			
& H. Co	67,175,112.75	65,814,079.28	1,361,033.47
Road and Equipment-Canadian			
Lines	6,464,030.48	6,331,867.72	132,162.76
Floating Equipment	5,931.00	6,726.00	-795.00
Coal Mining Department Equip-			
ment, Cars, Motors, Mules,			
Horses, etc	1,338,399.81	1,303,362,30	35,037.51
Coal Handling and Storage	-//	-,,	,
Plants	63,967.79	61,134.46	2,833.33
Stocks and Bonds	28,100,593.56	27.088.093.56	1,012,500.00
Cash	1,646,653.91	1,182,559.75	464,094,16
Fire Insurance Fund	417,614.67	373,904.51	43,710.16
Cash and Securities in Special	,	0,0,00,00	10,1 10110
Reserve Funds	10,073.00	9,738.00	335.00
Equipment Trust Fund	1,705,235.14	1,441,303.05	263,932.09
Supplies on Hand	3,300,996.73	2,781,672.78	519,323.95
Bills and Accounts Receivable	3,810,660.80	4,118,196.86	-307,536.06
Advances for Construction and	0,010,000.00	1,110,170.00	- 007,000.00
Acquisition of New Lines	4,275,292.95	3,427,607.68	847,685.27

Advances for Construction and			/
Acquisition of New Lines	4,275,292.95	3,427,607.68	847,685.27
Total	3135,418,470.60	\$131,497,370.70	\$3,921,099.90
	LIABILITIES.		
Items.	1913.	1912.	Increase or Decrease.
Capital Stock	\$42,503,000.00	\$42,503,000.00	
Bonds, 1943, 4%. \$27,704,000 1st Mtge. Bonds			
1917, 7% 5,000,000 The Adirondack Ry. Co. 1st Mtge.			
Bonds, 1942, 4½%			
R. 1st Mtge. Bonds, 1924, 6% 500,000 Debentures, 1916,			
4% 13,973,000 1st Lien Equipment Bonds,			
1922, 4½% 9,643,000 Debentures, 1914, 4% 100,000			
Loans Payable	57,920,000.00 4,500,000.00		\$251,000.0 0 1,000,000.0 0
Interest, Dividends, etc., Accrued	1,407,985.82	1,405,209.12	2,776.70
Interest, Dividends and Bonds due and not yet collected	227,143.31	195,086.81	32,056.50
Taxes accrued	277,797.71 10,073.00	157,041.56 9,738.00	120,756.15 335.00
Rolls	2,940,797.33 638,976.57	3,052,053.77 552,479.93	111,256.44 86,496.64

Appropriated Surplus — Additions to Property prior to June 30, 1907, through In-6,839,487.37 6,751,837.48 87,649.89

ANNUAL REPORT

ANNUAL	KEFOKI
THE DELAWARE AND HUDSON COMPA	NY—EIGHTY-FOURTH ANNUAL REPORT
GENERAL OFFICE. New York, N. Y., April 2, 1914. To the Stockholders of	Net Income Railroad Department
The Delaware and Hudson Company: The President and the Board of Managers submit the following statements of the affairs of the Company for the year ended December 31, 1913: The results from operation of the Coal Mining Department were:	Miscellaneous Income: Dividends and Interest on Securities Owned
Year. Coal Mined. † Revenues. ‡ Expenses. Net Revenue. 1913,170,553 tons. \$16,045,308.03 \$14,748,615.71 \$1,296,692.32 1912,6,438,555 " 13,397,557.48 12,811,520.34 586,037.14	General Interest and Discount 16,634.56 25,469.23 —8,834.67 Total income
Increase 731,998 tons. \$2,647,750.55 \$1,937,095.37 \$710,655.18	Net Income General \$59,333.21 \$70,357.90 —11,024.69
† Excluding dividends received from stock of Coal Companies owned.	Net Income Carried to General
‡ Excluding taxes. Percentage of	Profit and Loss\$6,174,735.60 \$5,506,089.42 668,646.18 14.53% on 12.95% on
Year. Operated. Operated. Revenues. CExpenses to Expenses to Expenses. Revenues. Revenues.	Percentage to Capital Stock\$42,503,000.00 \$42,503,000.00 FINANCIAL. CAPITAL STOCK AND FUNDED DEBT.
Increase \$1,673,391.78 \$1,143,528.11 \$529,863.67 .40	The Capital Stock of The Delaware and Hudson Company on December 31, 1913, was \$42,503,000, no additional shares having been issued during the year.
‡ Excluding taxes. † This figure is 26.39 miles greater than shown in 1912, the figures having been recast on account of remeasurements, and also due to the inclusion of various short pieces of main line track, formerly treated as sidings and spur tracks.	The Debentures of 1914, outstanding at the close of the year were \$100,000, having been reduced by the payment, on January 1, 1913, of \$200,000, maturing as of that date. The amount of First Lien Equipment Bonds of 1922, outstanding December 31, 1913, was \$9,643,000, bonds aggregating \$51,000, having been retired during the year through the operation of the Sinking Fund estab-
RAILROAD DEPARTMENT. REVENUES AND EXPENSES.	lished in connection with their issue. The First and Second Mortgage Bonds of the Saranac and Lake Placid
The general distribution of the Operating Revenues and of the Operat-	Railroad Company aggregating \$144,000, matured November 1, 1913, and the money was deposited with the Trustee to redeem them.
ing Expenses of the Railroad Department was as follows: Increase	In March, 1913, the Company applied to the Public Service Commission, Second District, of the State of New York, for permission to issue \$5,000,
Revenues: 1913. 1912. or Decrease. From Coal Freight Traffic\$11,436,959.90 \$10,346,094.92 \$1,090,864.98	000, par value, of its First and Refunding Mortgage Four Per Cent Gold Bonds, the proceeds to be used in paying the floating debt incurred for additions and betterments and to meet the cost of completing the work
" Merchandise Freight Trat- fic (including switch- ing)	additions and betterments, and to meet the cost of completing the work under way and of other contemplated improvements. On October 9, 1913, the Public Service Commission approved the issue of \$4,500,000, at 95 or better, reserving approval of the remaining \$500,000, pending the com-
" Passenger Traffic 3,277,928.68 3,076,507.07 201,421.61 " Express Traffic 334,279.74 305,119.40 29,160.34 " Transportation of Mails 121,793.50 119,445.51 2,347.99	pletion of an examination of the accounts of the Company. Approval, at an early date, is anticipated and the full issue of bonds desired will then
" Transportation of Mails. 121,793.50 119,445.51 2,347.99 " Miscellaneous Sources . 188,104.34 156,085.36 32,018.98	be available. Although, when the application was filed with the Com- mission, the officers of the Company as well as the bankers who were
Total Operating Revenues\$24,153,494.73 \$22,480,102.95 \$1,673,391.78 Expenses: For Maintenance of Way and	consulted believed that the bonds could be sold at a price that would net the Company 95 or better, the subsequent change in market conditions has made it impossible, up to the present time, to realize the price fixed by the Commission.
Structures	FLOATING DEBT. The Floating Debt of the Company amounted to \$4,500,000, on Decem-
" Traffic Expenses 305,965.69 289,754.01 16,211.68 "Transportation Expenses. 8,584,722.10 7,979,041.22 605,680.88 "General Expenses 778,042.04 626,888.98 151,153.06	ber 31, 1913, having increased \$1,000,000, during the year. This increase was largely necessary to finance, temporarily, addition and betterment work covered by the proposed issue of First and Refunding Mortgage Bonds;
Total Operating Expenses\$15,210,306.85 \$14,066,778.74 \$1,143,528.11	and, in part, was on account of advances to subsidiary companies (principally the Wilkes-Barre Connecting Railroad Company) for which this
Net Revenue from Operation \$8,943,187.88 \$8,413,324.21 \$529,863.67	Company later will be reimbursed.
Percentage of Expenses to Revenues	Sinking Funds. During the year there was paid to the Trustee under the First and Re-
GENERAL INCOME ACCOUNT OF THE DELAWARE AND HUDSON COMPANY, YEAR ENDED DECEMBER 31, 1913, IN COM-	funding Mortgage the sum of \$277,040, being one per cent of the par value of the First and Refunding Mortgage Gold Bonds outstanding May 1, 1913, making the total paid to date, \$1,173,550. In accordance with the terms of the trust agreement, this sum has been expended in additions and better-
PARISON WITH YEAR ENDED DECEMBER 31, 1912. Increase 1913, 1912. or Decrease.	ments to the property covered by the mortgage. A summary of the operations of the Sinking Fund under the First Lien Equipment Trust Indenture, from the date of its creation to December
COAL MINING DEPARTMENT: Gross Revenues\$16,045,308.03 \$13,397,557.48 \$2,647,750.55	31, 1912, follows: RECEIPTS:
Gross Expenses	Annual payments to Trustees, years 1908 to 1913, both inclusive, \$650,000 per year\$3,900,000.00 Interest on cash balances and investments 174,446,12
Taxes Accrued	Total\$4,074,446.12
Operating Income	DISBURSEMENTS: Seventy-seven Locomotives acquired\$1,916,821.71
Dividends and Interest 386,733.52 792,923.61406,190.09	Five Milk Cars acquired
Gross Income Coal Department \$1,188,425.84 \$1,023,868.07 164,557.77 RAILROAD DEPARTMENT:	quired
Gross Operating Revenues\$24,153,494.73 \$22,480,102.95 1,673,391.78 Expenses 15,210,306.85 14,066,778.74 1,143,528.11	One Bridge Erecting Car and Trailer acquired
Net Operating Revenues \$8,943,187.88 \$8,413,324.21 529,863.67 Taxes Accrued 623,107.27 600,944.31 522,162.96	One Snowplow acquired 5,040.42 Fifteen Cabooses acquired 10,500.00
Operating Income	Three hundred fifty-seven (357) The Delaware and Hudson Company First Lien Equipment Bonds
OTHER INCOME: Hire of Equipment \$213,752.30 \$99,596.29 114,156.01	purchased and retired (including accrued in-
Outside Operations26,667.42 -20,733.16 -5,934.26 Dividends and Interest 1,121,996.84 1,154,195.93 -32,199.09	terest)
Miscellaneous Items	Total\$4,074,446.12
	In accordance with the ordinance passed May 9, 1899, and amended at the annual meeting of stockholders held on May 10, 1910, there was ac-
Gross Income Railroad Department \$9,683,484.53 \$9,081,798.56 601,685.97 DEDUCTIONS FROM INCOME:	cumulated in the Coal Department Sinking Fund \$216,972.39. This amount has been applied toward advances to The Schuylkill Coal and Iron Com-
Rentals	pany and the Shanferoke Coal Company for the acquisition of anthracite lands in the Schuylkill section of Pennsylvania.
Mortgage Bonds (1943) 1,108,160.00 1,108,160.00 Interest on 1st Mtge. Bonds	. DIVIDENDS. On December 31, 1913, a dividend for the year 1914, upon the out-
(1917) 350,000.00 350,000.00 Interest on Debenture Bonds	standing \$42,503,000, of Capital Stock of the Company, at the rate of
(1916)	to \$3,825,270, was declared out of the earnings of the current and pre- ceding years.
Bonds (1922)	COAL MINING DEPARTMENT OPERATIONS.
(1914)	During the year 1913 this Company mined 7,170,553 gross tons of anthracite, out of a total of 69,069,628 tons, including product of washeries,
General Interest and Discount 205,160.92 95,310.15 109,850.77 Total Deductions \$4,756,507.98 \$4,669,935.11 86,572.87	produced in the region. This is 731,998 gross tons more than in 1912, the production of that year having been reduced by the suspension of mining from April 1 to May 21, inclusive, due to the strike.
Total Deductions \$4,756,507.98 \$4,669,935.11 86,572.87	naming from April 1 to May 21, inclusive, due to the strike.

In the report for last year reference was made to an agreement between the Mine Workers and the Anthracite Operators, for a period of four years, to end March 31, 1916. Section "D" of this agreement provides, in detail, a method for the adjustment, without strikes or lockouts, of all differences, including provision for the arbitration of matters not otherwise settled. The Company has at all times observed both the letter and the spirit of this agreement. It is regretted that notwithstanding this agreement the ceployes continue to strike first and then to invoke the intervention of the machinery provided to prevent strikes, rather than to remain at work and have the differences adjusted in the orderly manner provided by the agreement. During 1913 there were ten separate strikes which caused the temporary idleness of one or more collieries, the total loss of time being equivalent to the closing of one collieries, the total loss of time being equivalent to the closing of one collieries, the total loss of time being equivalent to the closing of one colliers, the total loss of time being equivalent to the closing. Recent discussion of this general subject, particularly in the City of Scranton, has been accompanied by extreme demands which, if admitted, would greatly enhance the cost per ton of anthracite recovered and materially reduce the ultimate proportion of the total supply in the ground that could be made available for consumption. It is not believed that these demands will ever be sanctioned by statute or that any statute attempting to sanction them would be valid.

Effective June 28, 1913, the State of Pennsylvania imposed a so-called Ad Valorem Tax of 2½ per cent of the value of anthracite when prepared

would be valid.

Effective June 28, 1913, the State of Pennsylvania imposed a so-called Ad Valorem Tax of 2½ per cent of the value of anthracite when prepared for market. No tax was imposed upon bituminous coal. This new tax is substantially equivalent to ten cents per ton on the domestic sizes, the only sizes not marketed in competition with bituminous coal, and, therefore, the only sizes from which it could be recovered. It became necessary, therefore, to add ten cents per ton to the market price of each of the domestic sizes.

fore, the only sizes from which it could be recovered. It became necessary, therefore, to add ten cents per ton to the market price of each of the domestic sizes.

The new colliery at Archbald, Pa., was completed during the year and placed in operation during April, 1913. At the same time, White Oak breaker was abandoned and dismantled, the coal from that district now passing through the new breaker at Archbald, along with coal from other lands now being developed. A new washery is under construction to teclaim coal from the culm bank at the Marvine colliery, situated in the northern part of the City of Scranton. Work is in progress to connect the underground operations at Plymouth No. 2 with Plymouth No. 5, with a view, upon completion, of abandoning Plymouth No. 2 breaker, and handling all of the output through Plymouth No. 5, thus combining the two operations.

handling all of the output through Plymouth No. 5, thus combining the two operations.

During the year the enlargement of the electric plant at Coal Brook colliery, Carbondale, Pa., was completed and it now furnishes power and light for four collieries located between Jermyn, Pa., and Forest Sity, Pa. Work was continued on a large electric plant at Olyphant colliery, Olyphant, Pa., which, when completed, will furnish power and light to four collieries located between Scranton, Pa., and Archbald, Pa.

In the past three years about \$140,000.00 has been expended for concrete barns in the mines replacing those made of wood; and for the installation of protective apparatus to guard the lives of employes and the Company's property against fire.

Development work was continued and facilities increased during the year, in order to maintain the output. The charges therefor, to Extraordinary Expenses of the Coal Mining Department, amounted to \$970,535.80, against \$857,975.42 in 1912.

The expenditures of \$215,051.72 for new engines, new boilers, boiler houses and fittings; \$63,646.07 for new pumps and pump rooms; and \$23,

\$857,975.42 in 1912.

The expenditures of \$215,051.72 for new engines, new boilers, boiler houses and fittings; \$63,646.07 for new pumps and pump rooms; and \$23,840.81 for tracks, compressors, etc., were required mainly to make these facilities sufficient to maintain the present output and were made necessary by the augmented area of underground workings due to increased ages of mines. This is illustrative of expenses other than changes in the wages schedule, which tend to enhance the cost of producing coal from year to year.

RAILROAD DEPARTMENT

OPERATING REVENUES.

The increase in Operating Revenues over the year 1912 was \$1,673,391.78. The revenue from Coal Freight traffic increased \$1,090,864.98; the revenue from Merchandise traffic increased \$317,577.88; the revenue from Passenger traffic increased \$201,421.61; and the revenue from Miscellaneous sources increased \$63,527.31.

OPERATING EXPENSES.

OPERATING EXPENSES.

The increase in Operating Expenses over the year 1912 was \$1,143,528.11. Maintenance of Way and Structures Expenses decreased \$15,27,38.51; Maintenance of Equipment Expenses increased \$23,212.100; Traffic Expenses increased \$16,211.68; Transportation Expenses increased \$605,680.88, and General Expenses increased \$15,153.06.

The ratio of Operating Expenses to Operating Revenues in 1913 was 62.97 per cent, as compared with 62.57 per cent in 1912.

The decrease in expenses for Maintenance of Way and Structures was largely due to the heavy charges in 1912 on account of maintenance charges incidental to the strengthening of bridges and other additions and betterment work then under way.

The increase in the Maintenance of Equipment Expenses was due to an increase of \$215,483.69 in Freight Train Car Repairs and an increase of \$233,512.39 in Freight Train Car Renewals. The Freight Train Car Repairs resulted from an increase of 12,564,332 miles, or 7.74 per cent, by freight train cars. The increase in Freight Train Car Equipment is being rebuilt, applying thereto steel in place of wooden underframes. Under the accounting rules, insisted upon by the Interstate Commerce Commission, this rebuilding necessitates considerable charges to Operating Expenses, although its result is to place the Company in the possession of substantially new equipment of the best quality and efficiency at an expense very much lower than would be involved in obtaining it in any other way.

at an expense very much lower than would be involved in obtaining it in any other way.

Increased traffic naturally required some increase in the Transportation Expenses. In addition there were large increases in wages, discussed in detail at another place in this report, which resulted from arbitrations, under the Acts of Congress known as the Erdman and Newlands laws, of differences with employes represented by the Brotherhood of Locomotive Engineers, the Order of Railway Conductors and the Brotherhood of Railroad Trainmen. Increases due to the so-called "full crew laws," requiring the payment of superfluous employes, are also discussed elsewhere.

ADDITIONS AND BETTERMENTS-ROAD

Work under the program of renewing and strengthening bridges on the main lines to make them capable of carrying E-5 consolidation engines, as mentioned in the Annual Report for 1912, was continued during the year 1913, resulting in charges to Additions and Betterments of \$106,845.81 and to Operating Expenses of \$40,319.32. This work will probably be completed during 1914. Strengthening the bridges on the line between Saratoga Springs and North Creek, to make them capable of carrying Consolidation Engines of classes E to E-3 inclusive, was undertaken and

will be completed early in 1914. The bridge over the Hudson River at Waterford, N. Y., on the Troy Branch has been reconstructed and made capable of carrying heavier engines, in connection with the changes made necessary by the construction of the Barge Canal at that point. The bridge carrying the Troy Road and the tracks of the United Traction Company over the tracks of The Delaware and Hudson Company at Menands, N. Y., is being improved and lengthened so as to provide increased horizontal and vertical clearances and room for additional main tracks in connection with the reconstruction of the Troy Road as a State Highway. There had been expended to December 31, 1913, \$43,47.10.4, of which \$23,424.23 is chargeable to Additions and Betterments. A tract of quarry land near Cobleskill, N. Y., has been acquired, to provide material for reballasting the Susquehanna Division.

The installation of block signals between Plattsburgh and Rouses Point, N. Y., has been authorized, and will be completed during the year 1914. The estimated cost is \$41,000. When this work is complete the entire line from Binghamton to Nineveh, and from Wilkes-Barre to Rouses Point, will be equipped with modern block signals. The elimination of grade crossings at Slingerlands, N. Y., and Robinson Street, Binghamton, N. Y., mentioned in the 1912 Annual Report, was completed during 1913, and that at Bainbridge, N. Y., will be completed during 1914.

A passing siding extending from West Chazy to Canada Junction, 80-car passing sidings at Wadhams, Crown Point and Montcalm Landing, N. Y., and additional yard tracks at Rouses Point were constructed during the year 1913. The enlargement of the freight house and provision of additional tracks at Green Island, N. Y., and the impovement of the station and yard facilities at Sidney, N. Y., mentioned in the 1912 Annual Report, were completed during the year. The construction of additional yard and car repair tracks, new 5-stall engine house, ash pit, turntable and locomotive coaling plant at Mechanicville

483.08 has been expended thereon during the year. The work will be continued during 1914 and 1915, with an estimated expenditure of \$130,000 each year.

An expenditure of \$59,372 for bridge and track construction to reach the new washery and breaker plant to be known as Marvine Breaker No. 2, at Providence, Pa., has been authorized. On this improvement the sum of \$26,856.33 was expended during the year, all chargeable to Additions and Betterments. Additional coal and ash facilities at Oneonta, N. Y., and a new coaling plant at Saratoga Springs, N. Y., were completed and put in operation during the year.

An expenditure of \$776,000 for improvements at Albany, N. Y., including the purchase of additional lands, rearrangement of tracks, and the erection of a modern general office building and freight terminal, has been authorized. During the year a new passenger station has been constructed at Riverside, N. Y., and the old passenger station remodeled for use as a freight house, at a cost of \$17,032.72, of which \$15,280.72 is chargeable to Additions and Betterments. There are under way minor improvements to stations and freight facilities at Binghamton, Plattsburgh, Ticonderoga, and North Creek, N. Y.

Addition to power equipment at Oneonta, N. Y., shops, made necessary by the increased car repair work, was practically completed at the close of the year. To December 31, 1913, \$46,483.05 was expended, all of which is chargeable to Additions and Betterments. The addition of four boilers and one blower at the Mechanicville power plant was commenced late in the year and will be completed during 1914.

Water facilities were enlarged during the year by the erection of 100,000-gallon tanks at Oneonta and Cobleskill, N. Y. A 50,000-gallon tank at Hudson, Pa., and improvement of the water facilities at Saranac Lake, N. Y., are now under way.

ADDITIONS AND BETTERMENTS-EQUIPMENT.

Additions and Betterments—Equipment.

The work of equipping with steel underframes, 200 box cars of 60,000 pounds capacity, 400 coal cars of 80,000 pounds capacity and 200 coal cars of 60,000 pounds capacity, mentioned in the 1912 Annual Report, was completed during 1913 at a cost of \$336,872.99. This is a part of the general program of reconstruction, already referred to herein, under which the quality and capacity of this Company's equipment are being improved and increased.

During the year 10 baggage and mail cars were equipped with steel underframes and trucks. Arrangements have been made to equip 10 class E-5 consolidation locomotives with superheaters, thus effecting economy in fuel consumption. This is estimated to cost \$25,000.00. There were received during the year the 15 Class E15 Consolidation Locomotives, one (1) one-hundred ton wrecking crane and one (1) bridge erecting car and trailer with necessary equipment which were ordered in 1912, all of which were paid for from funds accumulated under the First Lien Equipment Trust Indenture.

The net changes, mostly charges but involving credits as indicated, during the year on account of Additions and Betterments to the Company's railroad (including expenditures on account of items mentioned above) amounted to \$1,388,503.58, details of which are as follows:

JAD.	
Right of Way	\$124,368.58
Real Estate(Credit)	3,200.00
Protection of Banks and Drainage	14,337.02
Grade Reduction and Change of Line. (Credit)	37,734.68
Bridges, Trestles and Culverts	122,490,99
Increased Weight of Rail	32,150,62
Improved Frogs and Switches	3.021.35
Track Fastenings and Appurtenances	36,535.08
Sidings and Spur Tracks	95,078,77
Terminal Yards	54,009.84
Fencing Right of Way	898.56
Improvement of Crossings-Under and over	31,424.73
Elimination of Grade Crossings	12,284.56
Interlocking Apparatus	3,054,04
Block and Other Signal Apparatus	2,502.67
Telegraph and Telephone Lines	3,696,45
Station Buildings and Fixtures	65,482.34
Roadway Machinery and Tools	6,679.35
Shops, Engine Houses and Turntables	54,687,67
Shop Machinery and Tools	249,798.55
Water and Fuel Stations	67,363.55
Dock and Wharf Property	51.90
Other Additions and Betterments	19,306.87
Work in Progress	82,625.66

 EQUIPMENT:
 \$339,118.00

 Steam Locomotives
 \$1,170.05

 Passenger Train Cars.
 (Credit)

 Freight Train Cars.
 (Credit)

 Work Equipment
 48,109.67

 Work in Progress.
 35,334.61

347,589.11

\$1,388,503.58 Grand Total 1913..... Extensive station and yard improvements have been undertaken at Ticonderoga, N. Y., including a new passenger station, for which \$45,128.82 had been expended to December 31, 1913. The cost of this work is being paid for from accumulations under contract with the Ticonderoga Rail-

had been expended to December 31, 1913. The cost of this work is being paid for from accumulations under contract with the Ticonderoga Railroad Company.

The organization of the Wilkes-Barre Connecting Railroad Company, to construct a railroad connection between the Pennsylvania Railroad and the lines of this Company near Wilkes-Barre, was noted in the Annual Report for 1912. The line has been surveyed, the necessary right of way acquired and the work of grading is nearing completion.

acquired and the work of grading is nearing completion.

Allied Steam Railways.

The Greenwich and Johnsonville Railway Company shows an increase in Operating Revenues for the year 1913 of \$2,751.02 as compared with the previous year. The Operating Expenses decreased \$5,710.89. The Net Income for the year was \$26,303.66, an increase of \$479.54. A dividend of 6 per cent. for the year ended June 30, 1913, was declared. During the year new abutments for seven bridges were constructed at an expense of \$15,501.50, of which \$7,909.50 was charged to Additions and Betterments and \$7,592.00 to Operating Expenses. Extensive improvements at Greenwich, N. Y., consisting of the reconstruction of the yard, remodelling of the existing station for exclusive use as a freight station and construction of a new passenger station, were completed during the year.

remodelling of the existing station for exclusive use as a freight station and construction of a new passenger station, were completed during the year.

The Quebec, Montreal and Southern Railway Company shows an increase in Operating Revenues of \$13,847.50 for the year 1913, as compared with the previous year. The Operating Expenses increased \$104,376.12. Income from the Hire of Equipment increased \$\$8,231.84. The Net Income, not allowing for interest charges due to The Delaware and Hudson Company, amounted to \$129,292.75, a decrease of \$27,986.23. The increase in the Operating Expenses was largely due to the heavy floods in the spring, which carried away the bridges over the St. Francois river and caused serious damage to other property.

The Napierville Junction Railway Company shows an increase in Operating Revenues for the year 1913, of \$32,934.88, as compared with the previous year. The Operating Expenses show a decrease of \$2,923.12. The Net Income amounted to \$52,873.13 or 8.81 per cent on the Capital Stock outstanding, an increase of \$33,456.69 over the previous year. A dividend of 3½ per cent for the year ended December 31, 1913, was declared.

Contract has been entered into with the Grand Trunk Railway Company whereby The Delaware and Hudson Company will run one or more of its through Montreal passenger trains, each way daily, between the international boundary line and Delson Junction, Que., over the Napierville Junction Railway.

Allies Electric Railways.

ALLIED ELECTRIC RAILWAYS.

national boundary line and Delson Junction, Que., over the Napierville Junction Railway.

Allied Electric Railways.

Allied Electric Railways.

Increases in Net Operating Revenues were as follows: United Traction Company, \$36,652.14; Hudson Valley Railway Company, \$10,551.07; Schenectady Railway Company, \$41,318.20. The Net Operating Revenues of the Troy and New England Railway Company and the Plattsburgh Traction Company decreased \$377.79 and \$390.69, respectively. Dividends of 4 per cent for the year 1913 were declared on the Capital Stock of the United Traction Company; 6 per cent on that of the Schenectady Railway Company; 2½ per cent on that of the Plattsburgh Traction Company; 7 per cent on that of the Plattsburgh Traction Company. The United Traction Company has reconstructed and repaved 2.09 miles of single track—1.52 miles on Pearl Street and Broadway in Albany, N. Y., and .57 mile on River Street in Troy, N. Y.; has resurfaced, re-aligned and re-paved 5.34 miles of single track—2.44 miles on Hudson, Delaware and Central Avenues in Albany and 2.90 miles on Fourth Street and Second Avenue in Troy; and has constructed one mile of additional second track on Fourth Street between Burden Avenue and the Troy Union Railroad Crossing in Troy. During the year twelve new, double-truck, prepayment cars, each having a seating capacity of forty-six (46), were purchased by the Northern New York Development Company and leased to the United Traction Company, increasing the total number of prepayment cars operated by the Traction Company to seventy-two (72).

The Hudson Valley Railway Company has completed the work of paving Lawrence Street in Glens Falls, N. Y., reference to which was made in the Annual Report for 1912. Tracks on Main Street in the Village of Stillwater were reconstructed and paved for a distance of 5,782 feet in connection with the reconstruction of this street as a State highway. Various streethes of track between Fort Edward and Thomsons, between Glens Falls and Saratoga, and between Mechanicville

ALLIED BOAT LINES.

ALLIED BOAT LINES.

The Operating Revenues of The Champlain Transportation Company show an increase of \$1,033.07 and the Operating Expenses show an increase of \$18,504.77 as compared with the year 1912, making a decrease in Net Operating Revenues of \$17,471.70 for the year. The Operating Revenues of The Lake George Steamboat Company show a decrease of \$220.68 and the Operating Expenses show an increase of \$1,962.65 as compared with the year 1912, making a decrease in Net Operating Revenues of \$2,783.33 for the year. The Operating Expenses of the Champlain Transportation Company increased by reason of the increased Maintenance of Vessels, \$3,754.10; the increased Maintenance of Terminals, \$6,267.08, caused by the extreme high water prevailing during the Spring of 1913; the increased price and quantity of fuel consumed, \$5,482.89; the increased cost of food stuffs, and a longer operating season for the Steamer "Ticonderoga."

LITIGATION.

LITIGATION.

During the year, Katharine S. Weld, and others, brought action against the Company, claiming deficiency in royalties paid them, as successors to the interest of Henry B. Rockwell in the coal leased by him to this Company in 1859. This case is now pending.

CREATION OF PUBLIC SERVICE COMMISSION OF PENNSYLVANIA. An Act of the Legislature of Pennsylvania, approved July 26, 1913, created a Public Service Commission and abolished the former Railroad Commission. The new Commission apparently has power to fix, reduce and regulate rates, to establish joint through rates and the divisions of such rates; to require the publication of rates and schedules; to prescribe and regulate distribution of cars, granting of switches, connections and sidings, and the safety and adequacy of facilities, plant and equipment; to determine and prescribe just, reasonable, safe, adequate and sufficient service, facilities, rules, regulations and practices; to regulate crossings by railroads of highways, railroads and street railroads, and to require the relocation of existing crossings; to investigate issues of stocks, bonds, etc., to determine whether such issues are lawful (but approval is not required as a condition precedent to such issues); to establish systems of accounts and enforce compliances therewith; to regulate the sale, leasing and merger of powers, franchises, etc.

CAUSES ADVERSELY AFFECTING RAILROAD INCOME.

CAUSES ADVERSELY AFFECTING RAILROAD INCOME.

Those causes, some of them legislative, and all of them beyond the control of railway managers, which during recent years have continuously operated to enhance the difficulties attending the effort to maintain a reasonable margin between operating revenues and necessary expenses for taxes and for operation, were not less effective during the year covered by this report. Increases in rates of wages, consequent upon arbitrations under Federal statutes which, although nominally requiring the voluntary acquiescence of the railways really operate, under ordinary circumstances, with compulsory force, supplemented by reductions in the hours of labor and relaxations in the conditions necessary to secure from each unit of labor its maximum of reasonable efficiency, and increases in prices of materials and supplies, themselves mainly attributable to higher wages and lower efficiency of labor, have greatly augmented operating expenses. At the same time the taxing authorities have continued to impose upon the railways a heavier proportion of the steadily rising expenditures of government. Concurrently with these increases in necessary expenses, the process of attacking the rate schedules in detail, reducing here a single rate and there a group of rates, has operated to reduce the gross receipts on account of services rendered. While all these adverse forces have been in vigorous operation, the law has interposed to prevent, it is hoped but temporarily, recoupment from any source.

A—Increased Wages and Decreased Efficiency.

A-INCREASED WAGES AND DECREASED EFFICIENCY.

A—Increased Wages and Decreased Efficiency.

The award of the arbitrators in the case of the engineers, in effect during eight months of 1912, gave an advance of 4.34 per cent, and during 1913 cost this Company \$33,030.92. The arbitrators to whom the demands of the firemen were referred, reported on April 23, 1913, their award taking effect on May 1, 1913. The increase awarded was 8.16 per cent and the cost to this Company, to December 31, 1913, was \$27,308.53, or at the rate of \$40,962.80 per year. The demands of the conductors and trainmen, under discussion by the General Managers' Association of New York at the close of last year, were submitted to arbitration on July 26, 1913; the Board of Arbitrators reported on November 10, 1913, and the award took effect on October 1, 1913. The increase in wages awarded amounted to seven per cent and the increased expense to this company, from October 1 to December 31, 1913, to \$26,168.02, or at the rate of \$104,672.08 per year. An Act of the Legislature of New York, which took effect on September 1, 1913, required the railways of the State to place an additional and unnecessary employe on the majority of their trains. These employes in no degree increase the safety of operation or serve any useful purpose, but from September 1 to December 31, 1913, the added cost to this Company was \$40,832.88, or at the rate of \$122,498.64 per year. A similar Act of the Legislature of Pennsylvania, in effect since July, 1911, caused this Company an unnecessary additional expense, in 1913, of \$40,194.49. Together these items represent an increase in annual operating expenses of \$341,-358.93, which will, of course, become greater if the volume of traffic increases.

During the year which ended with June 30, 1913, the Railroad Department of this Company paid to its employes the sum of \$8,508,673, which was \$1,122,780, or 15.20 per cent, in excess of the sum that would have been paid for the same services at the rates of compensation that were in force on June 30, 1910. And this comparison takes no account of increases in wages that took effect after June 30, 1913.

B—INCREASES IN PRICES OF MATERIAL AND SUPPLIES.

There have also been many changes in prices of maetrial and supplies, and while there have been both increases and decreases, the former have affected the most important articles and the most extensive purchases and the latter have not been sufficient to offset them. An analysis of the changes since 1909 in prices of all material and supplies purchased by The Delaware and Hudson Company shows increases in the prices of twenty-eight out of fifty-nine articles of prime importance. The increased cost, on the basis of the purchases of 1912, due to changes in prices, was \$326,603.16, being the difference between a total increase of \$358,276,60 in the cost of the articles that have advanced and a total decrease of \$31,673.44 in the cost of those reduced in price. The aggregate sum expended in 1912 for these materials and supplies was \$5,239,288.35, or 6.65 per cent in excess of the sum that would have been necessary had the prices of 1912 been the same as those of 1909.

C—FEDERAL AND STATE REGULATIONS.

C-FEDERAL AND STATE REGULATIONS.

In addition to the foregoing burdens, in the shape of increased wages and higher cost of supplies, Federal and State regulation, in the form of hours of service laws for employes, full crew laws, requirements concerning the preparation, filing and posting of rate schedules and annual and periodical reports, locomotive regulations, such as those in regard to washing, testing and inspection, etc., employer's liability acts, elimination of grade crossings and other items of this character, has added the following sums to the operating expenses of The Delaware and Hudson Company:

 1907...
 \$78,716

 1908...
 143,980

 1909...
 214,457

 1910...
 222,204

 1911.....\$247,736 1912.....293,329 1913....325,497 Total..... \$1,525.919

Without discussing the propriety of the large expenditures which have been made for safety and signal appliances, it is proper to note that the amounts spent for these purposes aggregated, in the last seven years, \$1,509,805.

D-INCREASES IN TAXES.

Taxes have increased even more rapidly than other expenses. Comparing the year ended June 30, 1913, with the average for the past ten years, and also with the year ended June 30, 1910, it will be seen that the following increases have taken place:

1913 over	
ten-year average 1903-1912.	1913 over 1910.
25.68%	7.40%
37.19%	46.34% 21.06%
43.30%	28.20%
	1913 over ten-year average 1903-1912. 25.68% 47.56%

Stated in amounts, it appears that there has been an increase from \$237,539.55 in 1903 to \$621,190.04 in 1913; or, in other words, The Delaware and Hudson Company paid \$2.62 in taxes in 1913 for each \$1.00 so paid in 1903, an increase of 162 per cent. An increase in taxes, paralleling the increase in property investment, might perhaps be anticipated, but here it will be noted that the increase in taxes is even more excessive, as compared with the increase in property investment, than the increase in

as compared with the increase in property investment, than the increase in expenses.

An Act of Congress of October 3, 1913, imposed an annual tax of one per cent per annum upon the net income of all corporations. Under the Corporation Tax law, previously in effect, they were required to pay one per cent upon net income in excess of \$5,000 and were permitted to deduct, in arriving at taxable income, dividends received from other corporations subject to the tax. Under the new law a tax will be paid by companies from which The Delaware and Hudson Company receives dividends, and the latter will also pay on the same items, so far as they are included in its income. This double taxation and the removal of the \$5,000 exemption will add about \$15,000 to the tax payments of this Company.

The new Income Tax law has been construed by the Treasury Department as requiring one per cent upon interest payments to individuals to be retained by whoever makes the payment. Certain bonds issued or assumed by this Company were issued under mortgages providing for the payment of interest, "free from any tax which the Company may be required to pay thereon or retain therefrom." The Company has paid the interest on such bonds in full, thereby assuming the tax without prejudice however to its right to change its course should it seem proper to do so. The increased tax expense of this Company due to the assumption of the tax on these so-called "tax-free" bonds amounted, for the period covered (March 1 to December 31, 1913), to about \$3,000.

E-RATES.

these so-called "tax-free" bonds amounted, for the period covered (March 1 to December 31, 1913), to about \$3,000.

E—RATES.

On July 24, 1913, the Interstate Commerce Commission made an order in the matter of express rates, practices, accounts and revenues requiring the express companies to adopt various rules and regulations, and prescribing an entirely new system and schedule of rates for all express services. The rates named by the Commission are materially below those formerly in effect. The application of certain railways to intervene in this proceeding and to be heard in defense of their rights under contracts with the express companies, was denied by the Commission. It is difficult to estimate the loss to this Company consequent upon this action of the Commission, largely owing to the fact that reductions in the revenues of the express companies were also caused by the orders of the Postmaster General increasing the maximum weight of packages carried by Parcel Post, which have undoubtedly resulted in the withdrawal of a large number of packages from the express companies.

The scope of the Federal mail service was extended on January 1, 1913, by the inauguration of the Parcel Post with a weight limit of eleven pounds and a greatly reduced scale of rates of postage. This involved a large addition to the volume of mail carried by the railways and the charge was very inadequately recognized by an addition of five per cent to the mail pay of certain railways. But the lines of this Company and all others on which the mails were weighed during the Spring of 1913 were excluded from the operation of this provision. This early weighing did not, however, provide adequately for the additional Parcel Post mail for the reason that it took place while the new service was in its earliest stage of development. Subsequent to the weighing there was a considerable increase in the number of packages within the eleven pound limit and, moreover, the weight limit has been twice increased, on August 15, 1913, and January 1, 19

F-Decrease in Net Corporate Income.

F—Decrease in Net Corporate Income.

The encroachment upon the amount to which capital is fairly entitled as recompense for its share in the accomplishment of the railroad, and the insufficiency of the sums remaining after the payment of operating expenses, taxes, etc., to hold out to the investor adequate assurance of protection to his investment, are shown by the increasing proportion of the total income which they consume.

A study of the amount and proportion of the total annual income from 1903 to 1913, derived from all sources, and the amounts and percentages of such total income classified according to the purpose for which each was distributed, indicates that in 1903 wages and salaries consumed 27.30 per cent of such total income; in 1913 these expenditures had increased to 33.34 per cent. Materials and supplies consumed 18.68 per cent in 1903 and 22.31 per cent in 1913. Taxes consumed 1.59 per cent in 1903 and 2.27 per cent in 1913.

Comparisons of the total income received in 1903 and 1913 and its distribution in the two years are afforded by the following:

-Year Ended June 30—

YEAR ENDED JUNE 30 Per cent of Per cent of Amount. Amount. Item. total. total. Total income\$14,974,497 \$27,338,533 27.30% 18.68% .03% 1.59% .65% 33.34% 22.31% .53% 2.27% 1.42% 6,100,427 144,931 621,190 389,019 alance available for interest, dividends, etc. 7,750,522 51.75% 10,969,309 40.13% 100.00% \$27,338,533 100.00% \$14,974,497

G-DIFFICULTY OF OBTAINING NECESSARY RAILWAY CAPITAL.

G—Difficulty of Obtaining Necessary Railway Capital.

From the conditions described it has resulted that, although the railways now represent a largely increased investment of capital, they have a smaller annual margin of gross income over necessary expenses and taxes than they enjoyed when the capital employed was much less than it is at present. With this situation, the pressure of traffic upon facilities and the public demand for increased comfort and safety of travel and transportation have continued, so that the railways are required to make large additions to their capital while their ability to attract new capital and even properly to recompense the capital already employed is steadily diminishing. Moreover, there has lately been a world-wide rise in rates of interest, which has affected all classes of American securities, with the exception of those of the great manufacturing corporations. The heavily increased borrowings of American municipalities have led to higher rates of interest on their bonds, which formerly yielded materially lower returns than railway securitors because these corporations have succeeded in convincing many investors of the substantial stability of the still higher rates they offer. Thus the difficulty of obtaining needed railway capital has been greatly enhanced by the competition of two classes of applicants for portions of the fund seeking investment, neither of which formerly appealed with much effect to those from whom railway capital must principally be derived.

by the competition of two classes of applicants for portions of the find seeking investment, neither of which formerly appealed with much effect to those from whom railway capital must principally be derived.

H—REMEDIES.

In its earlier stages, the movement which has been set forth was met, more or less effectively, by economics in operation, principally secured by larger cars, heavier rails, stronger bridges, additional main tracks, more sidings, passing tracks and yard tracks and facilities, and improved appliances of many kinds, all involved heavy permanent investments, but leading to more efficient performance. By such means, for example, the average freight train load of this Company and affiliated lines was increased from 389.92 tons during the year ended June 30, 1903, to 558.27 tons of the second strains of the second from 389.92 tons during the year ended June 30, 1903, to 558.27 tons the second strains of the second from 189.20 tons of

Note—The data in Sections D, F and H include the operations of this Company and affiliated lines submitted to the Interstate Commerce Commission for the fiscal years ended June 30, while the statistical tables in this report exclude the affiliated lines and cover the calendar years ended December 31. [The Balance Sheet is on p. 81.]